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ABSTRACT

The Design of Information Systems in the Social Sciences (DISISS) is a research project with the objective of carrying out research necessary for the effective design of information systems in the social sciences, whether by the creation of new systems or the modification of existing systems. This working paper reports the work to date on the collection and analysis of citations taken from social sciences journals. The data will be used in part to describe the major parameters of the social science literature, and in part for the work on clustering. The purpose of this report is four-fold. First, the general problem of selecting source journals will be considered. Second, the procedure adopted for the DISISS pilot citation study carried out in 1971 will be reviewed, together with a report of the study and an analysis of the findings. Third, the planning for the main DISISS citation study will be considered in the light of the pilot study, and fourth, progress on the main study will be reported. (Related reports are LI004401 and 004403.) (Author/SJ)

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Design of Information Systems in the Social Sciences

Working Paper No. 5

CITATION PATTERNS IN THE SOCIAL SCIENCES: RESULTS OF PILOT CITATION STUDY AND SELECTION OF SOURCE JOURNALS FOR MAIN CITATION STUDY

October 1972

LI 004 402

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CONTENTS

		Page
	PREFACE	
1.0	GENERAL PROBLEMS	1
1.1	Introduction	1
1.2	Definition of the field of study	1
1.3	Methods of analysing citation data	3
1.4	Restrictions imposed by limited resources	6
1.5	Effect of source journals upon citation patterns	6
2.0	PILOT CITATION STUDY	9
2.1	Reasons for pilot study	9
2.2	Citation Record 1972	10
2.3	Selection of source journal titles	10
2.4	Method of data collection	13
2.5	Results and discussion	14
2.5.1	Compilation of list of journal titles by frequency of citation	14
2.5.2	Form of cited item (field 12)	15
2.5.3	Number of citations per article	16
2.5.4	Distribution of citations across journals	17
2.5.5	Relationship between source journals and cited journals	23
2.5.6	Citations from social science to other fields and citations from other fields to social science	28
2.5.7	Journal self-citation	33
2.6	Conclusions	36
3.0	MAIN CITATION STUDY	37
3.1	Introduction	37
3.2	Social science journals covered by ISI tapes	38
3.3	Sampling source journals	39
3.4	Citation Record 72	45
3.5	Organization of data collection in London libraries	46
3.6	Results	46
3.7	Analyses	48
3.8	Completion of data collection	49
	REFERENCES	50
	FIGURES	
	APPENDICES	

LIST OF TABLES

Table No.	Title	Page
1	Form of cited document	15
2	Parameters of Bradford curves relating cumulative number of citations to number of journals	20
3	Scatter of citations across journals in pilot study	21
4	Scatter of citations across journals in other fields	22
5	Rank list of journals according to percentage of self-citations	33
6	Subject classification of 100 most frequently cited journals	41
7	Number of journals, by subject classification, common to list of cited journals in pilot study and list of journals judged important	44
8	Classification of source journals by country of origin	47
9	Citations collected in main study, by subject classification	48

LIST OF FIGURES

Figure No.	Title
1	Journals cited twice or more
2	All journals cited
3	Journals cited twice or more with criminology source journals removed
4	Journals cited twice or more with psychology source journals removed
5	Journals cited twice or more with sociology source journals removed
6	Journals cited twice or more with economic source journals removed
7	Journals cited twice or more

APPENDICES

Number	Title
1a	Citation Data Collection Sheet (Pilot study)
1b	Citation Record 72
2	Summary of weighting values obtained for social science serials
3	Core journals identified by social science librarians (arranged by libraries contacted)
4	Source journals used in pilot study and summary of coverage
5	Notes on sampling of source journals
6a	Journals ranked by number of times cited, excluding self-citations, for data collected Summer 1971
6b	Pilot study: summary of results
7	Alphabetical list of cited journals (Pilot study)
8	Journals ranked by number of times cited, including self-citation (first 50 only)
9a	Division of source journals into two groups (Pilot study)
9b	Division of source journals into two groups: journals ranked by frequency of citation
10	Removal of citations in selected source journals from the citation file and recalculation of frequency of citation of journals
11a	CLOSSS titles on ISI Source Publications list
11b	Subject analysis of CLOSSS titles on ISI Source Publications list
11c	Source journals by subject covered by SCI 1970
12	Random sample of titles from CLOSSS
13	Core journals identified by social science librarians (arranged by subject)
14	Supplementary list of journal titles for Easter 1972, drawn from Appendix 13 and Dews (1969)

Number	Title
15	Foreign language titles
16	Summary of citation data collected Easter 1972
17	List of DISISS Working Papers

PREFACE

DISISS (Design of Information Systems in the Social Sciences) is a research project based at the University of Bath. The objective of the project is to carry out research necessary for the effective design of information systems in the social sciences, whether by the creation of new systems or the modification of existing systems. The project, which is financed by OSTI, commenced in January 1971 and will run until the end of 1973.

Work on other parts of the project is being reported in a number of working papers which are listed in Appendix 17. These working papers, together with an outline of work carried out in 1971, can be obtained from the Library, University of Bath.

The present working paper reports the work to date on the collection and analyses of citations taken from social science journals. The data will be used in part to describe the major parameters of the social science literature, and in part for the work on clustering.

DISISS has a very close working relationship with members of staff of the Polytechnic of North London (PNL), School of Librarianship, especially Mrs. P.L. Ward, Miss M. Ritchie and Mr. D. Nicholas. PNL participated in the planning stages of this part of DISISS and organised the collection of data which involved PNL students. Miss Ritchie and Mr. Nicholas edited the data in preparation for the machine file, and undertook many of the analyses reported in the Tables and Appendices.

This working paper was written by Mr. J.M. Brittain with assistance from Mr. S.A. Roberts and Miss B. Skelton. Mr. M.B. Line and Mr. R.G. Bradshaw read the draft versions and made many suggestions for improvements.

1.0 GENERAL PROBLEMS

1.1 Introduction

Any study of citation practices immediately encounters the problem of the selection of source journals from which to take, and subsequently count, citations. This aspect of citation counting has largely been ignored, but undoubtedly the selection of source journals may greatly influence the results of tne study. If no real effect is apparent, then the study can proceed without difficulty; but the absence of an interaction between source journals and citation counts must first be demonstrated. If it is apparent that source journals are significantly influencing the citation counts and citation networks the nature of the effect must be explored.

The purpose of this report is four-fold. First, the general problem of selecting source journals will be considered. Second, the procedure adopted for the DISISS pilot citation study carried out in 1971 will be reviewed, together with a report of the study and an analysis of the findings. Third, the planning for the main DISISS citation study will be considered in the light of the pilot study, and fourth, progress on the main study will be reported.

The general theory of citation studies, the rationale for studying the citation practices of social scientists, the value of measures of citation, and the use of citation data will not be discussed in this report. It is expected that the essence of this working paper will be incorporated, together with the findings from the main citation study, in a final DISISS report in 1973, where these aspects of citation studies will be discussed in the context of information requirements, and the design and provision of information services for the social sciences.

1.2 Definition of the field of study

Citation studies have usually been carried out for major subject areas; for example, physics, sociology, chemistry. One of the chief objectives of citation studies has been the compilation of a list of the most frequently cited journals in a subject. A listing of the most frequently

cited authors, monograph titles, and journal articles has also been attempted, although much less frequently.

Most citation studies can be criticized for paying little or no attention to the selection of source journals from which citations are taken. Many studies have taken six or seven journals judged by the investigator to be the most important, or the most frequently used, journals in the field they are studying. If source journals are the core journals of a discipline they will almost certainly feature prominently in the list of cited titles, and a list of cited titles will be fairly representative of the discipline in question. If the source journals are obscure they may not occur at all in the list of cited titles, which may not be representative of the discipline from which the source journals are taken. Very little has been done to establish the nature of citations in obscure journals but they probably do not contain a representative cross section of journals (or monographs) in any of the major disciplines. It is of course difficult, before a citation study is undertaken, to identify core or important journals in a discipline; furthermore, it may be difficult to identify disciplines, especially new fields and interdisciplinary areas, before a citation study is undertaken. One of the objects of a citation study is to aid the understanding of the nature of discipline boundaries and the important and core literature. In the social sciences in particular there is little agreement about some discipline boundaries, the classification of literature, and new areas of interest. It is therefore difficult to agree about the core literature of many areas in the social sciences.

One objective of DISISS is to study the feasibility of developing co-ordinated information services for the social sciences. Where clear discipline boundaries already exist and where information services already exist to meet the information requirements of disciplines, these may be considered as given factors in the design, but at some stage it will prove necessary to question existing discipline boundaries in the social sciences and existing methods of classification, because the use of literature by social scientists may approximate only very roughly to existing classificatory systems and subject boundaries. It was therefore necessary to look at the structure of social science citations

uninfluenced by arbitrary definitions of subject boundaries or existing classification schemes.

Given sufficient resources the best method would perhaps have been to draw a random sample of journals from the total universe of social science literature. The structure of the citation pattern in these source journals could have been identified - partly by clustering techniques - and the pattern of citation so identified compared with conventional subject boundaries and classificatory schemes. In practice, it has not been possible to use this ideal method. In the main citation study some of the source journals were drawn at random from CLOSSS[1], but others were taken from the pilot study list of most frequently cited journals, and from lists of journals compiled in accordance with the judgements of social science librarians about important journals. It was necessary to ensure, for the majority of source journals, that they received a fairly large number of citations from other journals cited. This is necessary if hierarchical ordering and clustering of journals is to be attempted. If the entire sample had been drawn at random from CLOSSS, a large number of journals would have made no citations to others and would have received no citations from other cited journals.

1.3 Methods of analysing citation data

There are many ways of analysing citation data: some of the methods of analysis are listed below. Since the method of analysis determines to a large extent the application of citation data to the design of information systems it is important to choose the most appropriate method for the objective in mind.

A basic distinction can be made between the source of citations and the citations (or bibliographical references) themselves. This distinction is sometimes referred to as the difference between citing and cited items (i.e. journals, authors, etc). In the present study citing journals are referred to as source journals.

In the present study data was collected about source journals and about items cited in them. It was therefore possible to analyse the

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[1] CLOSSS = Check List of Social Science Serials. This exists as a machine file of approximately 5,000 titles.

data relating to citations only, or to perform more extended analyses in which the relationship between source journals and cited items was examined.

The analyses which can be performed upon the citations only include lists, according to frequency of citation, of journals, authors, and articles.

The analyses[1] that can be performed when the relationship between source and cited item is taken into account include:

(i) a measure of effect of source journals on number and order of cited journals

(ii) a list of the most cited journals for each source journal

(iii) hierarchies of journals based upon the dependency of citations of one journal on another

(iv) clustering techniques in which a similarity measure between journals is based upon the Euclidean distance between pairs of journals or a correlational data.

In theory it is possible to perform the calculations (i) to (iv) on authors or even the titles of journal articles, but in practice only journal titles are commonly used. For example, it is possible, taking (ii) above as the model, to produce a list of the most cited authors, or journal articles for a source journal, or, taking (iii) as the model, to establish the hierarchies of authors based upon the dependency of citations of one author upon another. In practice, the frequency with which one author cites another is much smaller than the frequency with which one journal cites another. The same applies to the titles of journal articles. This means that there are a large number of authors (or journal articles) that receive citations but do

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[1] Another type of analysis that is possible with citation data, but not included here, is the coupling of articles, or books, by the number of references that they have in common. This is known as bibliographic coupling (Kessler, 1963, 1965).

not themselves make citations to those journals or authors that cite them. When this happens it is not feasible to establish hierarchies of journal articles or authors to produce correlation matrices or perform cluster analyses.

One very useful advantage of the method given in (iii) of producing hierarchies of journals based upon the dependency of citations of one journal on another is the division of journals into groups, thus delineating subject fields, etc. This method has been used by Narin, Berlt, and Carpenter (1972) in the field of chemistry to classify journals. This can be done by hand, and results in a manageable number of journals for use in clustering. In other words, a first cut-off point is obtained using a hierarchy or frequency measure, in which journals are divided roughly into subject, discipline, or interest groups. Cluster analyses can then be undertaken within the framework of such a grouping. This is more useful than performing the clustering initially on a large heterogeneous group of journals, partly because of the computational problem of dealing with more than 100 source journal titles in a cluster, and partly because of the difficulty of interpretating clusters derived from a large, heterogenous set of titles, covering many subject fields. The last point, made by Narin et al. (1972), may not be seriously applicable to DISISS, because one of the objectives is to investigate the value of cluster analysis in dividing the subject matter of the social sciences, where there is less agreement about discipline boundaries than in the physical and biological sciences.

After some of the relatively simple counting operations on citation data mentioned above have been performed, it is possible to use citation data to give an indication of the growth, decay, and rate of change of social science literature, and to establish the relationship of citation to demand for, and circulation of, literature.

After the clustering analyses mentioned in (iii) and (iv) have been completed, it will be possible to establish the relationship between the empirically derived clusters and conventional discipline

boundaries and classificatory systems. These aspects of the work on citation will be dealt with more fully in forthcoming working papers.

1.4 Restrictions imposed by limited resources

As already noted, one of the first decisions to be taken when planning a citation study concerns the type and number of sources from which citations are to be taken. Even when there is agreement about the boundaries of the subject to be studied it is not very common to find citation studies taking all the literature published in a field, mainly because the resources available for data collection and analysis are limited and because citation studies are usually aimed at fairly broad fields, where it would be quite impracticable to study all the literature. In any case, it would be quite unnecessary, provided that satisfactory sampling procedures can be applied.

When sampling is involved it is necessary to define the total universe of literature from which the sample is to be taken, and to ensure that the sample is representative. A representative sample can usually be obtained by taking a random sample, if the number in the sample is fairly large, but this cannot always be done in practice. In some instances the journals sampled at random may not be available in the place where the citation study is taking place, and there may be restrictions imposed upon the method of sampling by the statistical analyses which are to be applied to the citation data. For example, as already explained in 1.3 the restrictions imposed by the use of clustering techniques meant that random sampling could not be used as the sole method of selecting source journals.

1.5 Effect of source journals upon citation patterns

The number and type of sources may have an effect upon identified citation patterns. On the other hand, it is quite possible, given a fairly broad and representative sample of source journals, that the sources will exert little effect upon the resulting calculations. This has been the underlying assumption in DISISS, and has been tested out empirically; the results are reported and discussed in section 2.5. The assumption will be tested much more fully in the main citation study.

It is known that the vast majority of citations are to a relatively small number of journal titles[1], authors, and individual articles[2]. It is not certain that the distribution pattern found in the case of journal titles and journal articles applies to monographs: the degree of concentration may be much less.

When the concentration of citations is high, it is possible to choose a point of entry into the literature when selecting source journals with more confidence than when there is little or no concentration of citations upon a relatively few items. Where concentration is high there is a strong probability that the most frequently cited journals in a given discipline will be identified whether or not the core journals of the discipline are used as source journals, because, it is presumed, the probability that any citation will be to the core journals is greater than the probability that the citation will be to a fringe journal, irrespective of the source. Where concentration is low, the probability that core source journals will cite core journals is still relatively high, but the probability that fringe journals will cite core journals is low. Hence, if the source journals are predominantly fringe journals a very distorted citation pattern may emerge.

There are a number of other situations which can arise and which can influence the pattern of citation identified. Some examples are given below.

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[1] Most citation studies show a built-in bias towards those journals with most articles. Garfield (1972a) has suggested a method of eliminating this bias when calculating frequency lists of cited titles, but very few studies have taken this factor into account. The study by Martyn and Gilchrist (1968) of British scientific journals is an exception.

[2] Most citation studies have ignored the concentration of citations within journals, yet for any given title, relatively few of the articles it contains account for the majority of citations to that journal. Line, Sandison and MacGregor (1972), in a preliminary explanation of this phenomenon, found that about 10 per cent of articles from each of three science journals cover between 50 and 75 per cent of citations to each journal. Within journal concentration of citations is an important phenomenon and needs to be studied in the social sciences.

If the majority of source journals comes from a tightly knit subfield, a frequency list of cited journals would tend to be representative of this subfield only. However, it is suspected that this would be a fairly rare situation - perhaps found more commonly in applied fields. A more typical situation is one in which, although there is a good deal of scatter of citations across journals and monographs, a relatively small number of source journals can be used to produce a frequency list of cited titles which is little influenced - at least as far as the most frequently cited titles are concerned - by the journals used as sources. In other words, the upper part of a ranked list of cited titles taken from a relatively small sample of source journals should be much the same as the upper part of a ranked list of cited titles taken from all possible sources. The exact frequency of citation will of course be different, but the order of cited titles in the ranked lists should be very similar. In the case of infrequently cited titles, this similarity would not be found between ranked lists of cited journals taken from different groups of source journals because many of the cited journals would be relatively obscure and infrequently cited, and self-citations would in some cases be as great as citations to other journals. Middle-range journals of a ranked list of cited journals could be affected by the choice of source journals; this could affect their position in a ranked list, and in some cases titles that appear in one list of cited titles may not appear at all in another list derived from different source journals.

The ideal is to ensure as far as possible that all statements based upon citation analyses are relatively independent of the source journals used to generate the citations, except of course when the object of the study is the relationship between source items and cited items.

2.0 PILOT CITATION STUDY

2.1 Reasons for pilot study

A pilot study seemed desirable, partly because of the difficulty of selecting source journals for the main citation study, and partly because of the problems of designing a suitable record format, training students to collect citation data, locating material, editing and coding the data, and administering this work. In the absence of a pilot study it would have been impossible to time and cost these operations, and to decide upon the number of citations that could be collected, edited and processed within the time and funds available.

The pilot study had the following objectives:

(i) To provide feedback about the feasibility of using students to record citation data, to estimate time required for collection and location of material, and to test the data collection sheet

(ii) To examine the extent to which source journals have an effect on the list of cited journals

(iii) To provide a method for selecting source journals for future citation data collecting

(iv) To identify problems in data collection, editing, and analysis

(v) To provide data, along with future collections, for clustering experiments.

Although the number of data fields included in the pilot study was not the same as used in the main citation study, it has proved possible to make use of the data from the pilot study and combine it with data from the main study, and also from ISI tapes (see 3.2), in the clustering experiments. Also the pilot study provided details about six data fields which were not included in subsequent studies. These data fields have featured in descriptive studies[1] and the 5,000 citations

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[1] Descriptive studies involve, in the main, counting operations to determine, for example, the breakdown of citations according to the form of cited document (e.g. periodical, report, thesis), subject field of citation, country of origin, language, number of authors, etc. In fact, any of the data fields contained on the pilot study citation record or the Citation Record 72(see 3.4) can be used in a straightforward count; in addition any data field can be related to most other fields. These descriptive studies are distinct from the studies that involve the relationship between one journal title and another, or one author and another.

gathered in the pilot study have proved to be adequate for some of the descriptive work - especially as many of the analyses had to be done by hand.

2.2 Citation Record 1972

A preliminary list of data fields to be included in the pilot study was drawn up and circulated to interested persons in the field. After considerable discussion, 15 fields were agreed. These were included in the Citation Record 1972 which subsequently became known as the "long" record form (reproduced in Appendix 1a).

The 15 data fields allowed a comprehensive description of citations to be made, although it was decided that the creation of a machine file would be out of the question if all 15 fields were included (see 3.4 for list of data fields excluded in the main study).

2.3 Selection of source journal titles

The selection of source journal titles for the pilot study posed a problem because there existed no comprehensive bibliography of social science titles from which to sample, nor any comprehensive listing of social science serial titles according to frequency of citation.

The use of one or more of the large bibliographies of social science serials as a sampling frame was considered. These include Ulrich[1], Woodworth[2], and WLOSSP[3]. However, none of these bibliographies was found to be entirely suitable for use as a sampling frame. In the first place they contain only a partial listing of social science serial titles: this is particularly so with Woodworth which contains only British material, and WLOSSP which has selective international coverage, but gives very uneven coverage across the major social science disciplines. Secondly, large bibliographies can be extremely "noisy":

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[1] Ulrich's International Periodicals Directory. New York, Bowker, 1970.

[2] Woodworth, D. (ed.) Guide to current British journals. London, Library Association, 1970.

[3] World List of Social Science Periodicals. Paris, UNESCO, 1966.

for example, although Ulrich contains over 10,900 titles classifiable as social science many of the titles are related, for example, to trade serial publications. It is difficult to reduce this number by the use of objective criteria. The use of the list of periodicals maintained at the National Lending Library for Science and Technology was considered. It is estimated to contain between 5,000 and 8,000 social science titles, but it would have been very difficult to separate, according to objective criteria and without inspection of individual titles, the social science material from the main body of titles in the file.

An idea of the uneven coverage of the major social science disciplines by these bibliographies can be obtained by reference to Appendix 2: this data was gathered to test the possibility of weighting source journal titles according to the number of journal titles in each of the major disciplines in order to ensure that each discipline was appropriately represented.

It was decided to rely on the judgement of social science librarians in the first instance for the selection of source journals for for the pilot study. Librarians from the British Library of Political and Economic Science, British Institute of Management, Department of the Environment, Department of Trade and Industry, Royal Geographical Society, Royal Institute of International Affairs, Royal Institute of Public Administration, Royal Town Planning Institute, Tavistock/Joint Library, University of London Institute of Advanced Legal Studies, University of London Institute of Historical Research, and University of London Institute of Education were approached and asked to list the most important journal titles in the social sciences. These lists are given in Appendix 3 according to the libraries from which they were obtained, and in Appendix 13 broken down according to disciplines.

From the journals listed in Appendix 3, citations were taken from 17 in the pilot study (Appendix 4). This meant that the fields of management, planning, geography, law, history and education were not included in the pilot study. However, the list of journals in Appendix 3 was used again for the selection of source journals for the main citation study; for this purpose the disciplines not covered in the pilot study were included (see 3.3).

It is interesting to note that the OSTI-supported project, Organization of Information for Planning (OIP), used a similar method to select source journals for a pilot study of the nature of citations in planning literature.

At the beginning of a citation study it is necessary to decide upon the number[1] of source titles, the number of years, the number of articles from each source title, and the number of citations from each source article that can be covered with the resources available. There are very few guidelines here. For example, given fixed resources, it is difficult to know whether a large number of source journals should be included, thereby reducing the number of articles that can be taken from each journal title, or alternatively, whether to concentrate upon fewer titles but use all articles in each title. Further decisions have to be taken about sampling of the citations within each journal article. If a limited number of cited items from each source article had been taken in the pilot study, a greater number of source titles, or alternatively a greater number of years, could have been included. It was decided that sampling of cited items within a journal article would add a cumbersome and time consuming operation to the exercise, and this method was therefore discarded. It was estimated that the main citation study would be able to cover a sufficiently large range of social science journal titles to meet the requirements of the clustering experiments and the descriptive studies, and therefore sampling of citations in journal articles was unnecessary.

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[1] During the early stages of the pilot study it was envisaged that a list of source journals would be obtained by sampling at random from a comprehensive list of social science journals. Because it was impossible to know in advance how many journal titles could be covered in the pilot study it was necessary to use a method of sampling which would produce an open-ended number of journal titles at random from some universe of titles. Mr. Lievesley of the Polytechnic of North London School of Librarianship kindly prepared a paper outlining a method for accomplishing such an objective. This method, however, was not used in the pilot study because it was decided to select source journals according to the judgements of social science librarians. In the main citation study a random sample of 50 titles from CLOSSS was used, by which time it was possible to estimate very accurately the number of titles that could be covered with the resources available. However, Mr. Lievesley's paper is given in Appendix 5 because it does offer a very useful method for selecting source titles for a citation study which cannot estimate in advance of the sampling the exact number of titles that can be covered.

The pilot study was designed around estimates of the number of students available for collecting data during a period of three weeks in July 1971, and based upon an estimate of the number of citations that could be collected per hour. From tests with a small number of records and persons, it appeared that approximately 100 citation sheets could be completed per day by each person in favourable conditions.

It was decided to collect citations from the source journals mentioned above (see Appendix 4) for the years 1950, 1960, and 1970. Every third article in each title was taken from journals in these years. All citations from each article in the source journals were gathered.

2.4 Method of data collection

When the source journals had been identified, copies of the relevant years were located in London libraries. A manual was prepared to aid students in collecting the data, and preliminary sessions were held with the students to ensure that the record sheets would be correctly completed. During the period when the data was collected, Miss Ritchie and Mr. Nicholas visited the libraries in question, to check that students were carrying out the work correctly.

Citations to a given item from a single source were recorded once only. For example, if more than one citation was made in a source article to a single reference, whether in the footnotes or the bibliography, the citation was recorded once only. Where a reference was to a paper included in a collection, the collection, rather than the paper, was recorded as the cited item. If more than one paper in a collection was cited in the same source, the number of different papers cited was counted as the number of citations to that collection. Citations to conference proceedings were also recorded, in a similar manner.

It proved a relatively simple task for students to collect the data and few problems were encountered. It has been necessary to edit the completed record sheets.

2.5 Results and discussion

2.5.1 Compilation of list of journal titles by frequency of citation.

One of the main aims of the pilot study was to provide a frequency list of cited titles in the social sciences, from which source journals could be sampled for the main citation study.

The record sheets were sorted by hand and the frequency of citation of each title counted. The results are presented in Appendix 6a which lists the 222 titles cited twice or more. A further 397 journal titles were cited once only, and are incorporated in the complete list of cited titles given in alphabetic order in Appendix 7. From 17 source journals a total of 4,918 citations were gathered. Each article gave 12 citations on average.

Citations from 17 source journals were taken, but in the case of 8 titles complete coverage of articles in the relevant years was not obtained. Details relating to the coverage of sources are given in Appendix 4. It is doubtful if this missing data has affected the frequency list significantly: further data collection has been left until the main citation study.

The ranked order of journals according to frequency of citation is altered when self-citations are included. This list is given in Appendix 8 and should be compared with the list given in Appendix 6a where self-citations were not included in the ranking of the journal titles.

There is a preponderance of journals in psychology in the list of frequently cited titles. Although only three of the 17 source journals (i.e. 18.7 per cent) were in psychology, as many as 28 per cent of the first 222 cited journals were in psychology.

It is noticeable that two important scientific journals, Nature

and Science, appear high in the frequency list. These journals usually appear high in frequency lists of cited titles taken from scientific sources, but it is a little unexpected to see these journals cited so frequently by social scientists.

2.5.2 Form of cited item (field 12)

The breakdown of citations according to the form of the cited document is given in Table 1 below. The majority of citations were to monographs and journals, in about equal proportions. A large number of other forms were cited with a much smaller frequency. Some of these forms were not included in the 1971 record, for example, monographic series, radio broadcasts, dictionaries, and ministry circulars; these classifications were written into the record by the collectors.

TABLE 1
FORM OF CITED DOCUMENT
(field 12 of 1971 citation record)

Form	No. of citations	Percentages
Monographs	2,100	42.4
Journals	2,000	40.3
Reports	193	3.9
Newspapers	170	3.4
Legal/legislation	131	2.6
Monographic series*	100	2.0
Theses	66	1.3
Conference proceedings	50	1.0
Statistics	23	0.5
Radio broadcasts*	22	0.4
Unpublished	22	0.4
Personal contact	18	0.4
Yearbooks	9	0.2
Dictionary*	8	0.2
Command paper*	8	0.2
Mss/archives	6	0.1
Ministry circular*	6	0.1
Encyclopedia*	5	0.1
Lecture*	3	0.1
Bibliography	2	-
Census*	2	-
Cartographic	1	-
Index to research/theses	1	-
Opinion poll	1	-
News release*	1	-
Directory*	1	-
Computer program*	1	-
Unidentifiable	6	0.1
TOTALS	4,918	100.0

*Category not specified on the form, but written in by collector.

The results in Table 1 contrast markedly with similar studies in science. Garfield and Sher (1963) and Price (1965) reported data on the citations in fields of science covered by Science Citation Index. They gave figures of 84 per cent and 80 per cent respectively for the proportion of cited references accounted for by journals. Other studies have shown that the proportion of citations that are to journals are less in the fields of geology - 75 per cent (Craig, 1969), plasma physics - 67 per cent (East and Weyman, 1969) and electrical engineering - 62 per cent (Coile, 1969). Even so, the tendency to cite journals rather than other forms of literature is much stronger in science than in the social sciences.

The breakdown of the citations according to forms other than journals appears to vary appreciably from one discipline to another. In plasma physics, for example, reports account for 5.9 per cent of all citations, conferences 7.8 per cent, books 12.8 per cent and private communication etc. 3.1 per cent (Coile, 1969). The citation of reports is unexpectedly low in the light of an analysis of the forms of literature given in Nuclear Science Abstracts where 24.4 per cent of the items in the plasma physics section were to reports (Coile, 1969). In geology, on the other hand, 21.5 per cent of all citations were to books (Craig, 1969).

The present results show conclusively that monographs are much more likely to be cited in the social sciences than in science. Citations to monographs and journals taken together account for the overwhelming majority (83.5 per cent) of citations in social science journals - 42.4 per cent of citations to monographs and 40.3 per cent to journals. Next in order of magnitude come reports with 3.9 per cent of all citations. All forms of literature except monographs and journals account for only 17.2 per cent of citations.

Some of the forms in Table 2 are specific to the social sciences, such as newspapers and legal material. Conferences (1.0 per cent) and theses (1.3 per cent) account for very few citations.

2.5.3 Number of citations per article

Each article gave 12 citations on average. This figure is fairly close to the average number of citations per article of 13.7

and 15 reported by Garfield and Sher (1963) and Price (1965) respectively, for counts taken from Science Citation Index. However, figures for the average number of citations per article can be misleading. Price (1965) has shown that the distribution of citations across articles is skewed such that most authors cite between 5 and 10 references, and then progressively fewer authors cite an increasing number of references except those writing review papers or compiling bibliographies. The average can vary greatly from one subject to another and from one journal to another. For the present data, the average number of citations per article calculated for each journal ranged from 3 for American Psychologist to 52 for Psychologische Forschung (the averages for the other source journals are given in Appendix 6b). From the evidence available in the pilot study it is not possible to show conclusively that the social sciences are different from science with respect to the average number of citations per article. A more detailed study might show differences between social science and science relating to the range of citations per article across journals and differences between individual disciplines in the social sciences.

2.5.4 Distribution of citations across journals

The cumulative percentage of citations contained in the 222 journals cited twice or more was plotted against the number of journals to which these citations referred (Figure 1). It can be seen that the form of the curve conforms very closely to previous accounts of the distribution of citations across journals, that is, a Bradford distribution. When the total number of journal titles was limited to 222, 50 per cent of the citations to these 222 journals were accounted for by the top 33 journal titles and 90 per cent by the top 160 journal titles. A straight line fits the righthand side of the curve fairly closely. This is a typical finding when the accumulation of citations is plotted against a log distribution of the number of titles. The point of inflexion of the curve is approximately 17, and the projection of the best fit straight line onto the X-axis cuts the X-axis at approximately 5.0. When the citations to the 397 journals cited once only were included (Figure 2) a slightly different shaped curve was obtained, of which only the middle portion approximated to a straight line. It is noted that empirical Bradford distribution of citations

across journal titles rarely produce an exact fit to a straight line; the upper parts of the curve usually tail off (see Brookes, 1969, for examples).

According to Brookes (1969, 1970) both the point of inflexion (c) of the curve and the point (s) at which the projection of the straight line cuts the X-axis have significance for the breadth of the core literature[1] of the discipline under consideration. Brookes (1970, p.131) states that the numerical value of "s" is found to be not less than 1; the most specific subjects have "s" equal to 1, and more general subjects have larger values of "s" as their generality increases. The present data[2] gives a value of "s" of 4.7 and a value of "c" of approximately 17.

Brookes (1970, p.133) states[3] that the number of periodicals in the Bradford "nucleus" will be at least "e" x "s" where "e" (2.718...)

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[1] Sometimes referred to, by Brookes and others, as the "nuclear zone", although the terms "core literature" and "nuclear zone" are not always used synonymously. A further complication arises because, in an earlier paper, Brookes (1969, p.953) refers to a "nuclear zone" of periodicals which is equivalent to the value of "c". It is quite clear from empirical data that "e" x "s" $\neq$ "c". The terminology is confusing. For the present calculations in this report only the term "nucleus" is used, and is taken to refer to the value of "c". This is in keeping with the recent thinking of Brookes (personal correspondence) in which he states that the number of journals in the nucleus is given by "c" and plays down the emphasis which he previously gave to the relationship between "c" and "s".

[2] Because the data is only an approximate fit to a straight line it is possible to re-draw the straight line so that the values of both "s" and "c" are changed. The straight line was drawn to produce a best fit for the middle part of the curve because the upper extremities of the Bradford distribution, as mentioned above, usually depart from a straight line.

[3] The calculations reported here were completed before it was known (see footnote 1 above) that Brookes prefers to use "c" rather than "e" x "s" as a measure of the nucleus. An attempt was made to calculate the values of "c" from a visual inspection of the curves but it proved difficult to do accurately because of the error involved in drawing the straight lines. In order to calculate the parameters of the curve accurately it would be necessary to obtain a mathematical expression for the curve by regression analysis. From Table 2 it can be seen that the values of "c" are in all cases larger than the product of "e" x "s" but the interpretation of the data is little affected by the choice of "e" x "s" as the nucleus, with the possible exception of the calculation involving the removal of economics journals from the sources.

is the base of natural logarithms. For the present data this gives a value of approximately 12.8 for the number of journal titles in the "nucleus". It is interesting to have a look at the first 12 most frequently cited journals which go to make up this nucleus. If self-citations are excluded, the first 12 journals (see Appendix 6a) are in the fields of sociology, psychology and economics only. This means that the fields of anthropology, political science, criminology and social welfare, which were included in the source journals, are not included in the nucleus. If self-citations are included (see Appendix 8) sociology, psychology, and economics are again included, with the addition of anthropology (self-citation of American Anthropologist is high). In other words, the major fields covered by the source journals are included in the nucleus of periodicals. It is not surprising that criminology and social studies are not found in this list, as they were represented by only one source journal and they are relatively small fields. This analysis shows only that the major subject disciplines represented in the list of source journals are reflected in a rough subject classification of cited journals: if this had not occurred, then it would have been necessary to enquire why. Ideally, ranking should be done also within each subject field, to ensure that smaller fields are not neglected.

It is interesting to compare the value of "s" of 4.7 obtained for the present data with values obtained from other data bases reported by Brookes (1969). For a bibliography on muscle fibres a value of $s = 3.6$ was reported and $c = 18$; for an incomplete and selective bibliography on computer science, $s = 3.4$ and $c = 18$; for a bibliography in plasma physics, $s = 1$ and $c = 10$; and for data obtained by Wood and Bower on the use of abstracting serials in the social sciences values of $s = 1.21$ and $c = 9$ were obtained. It is to be expected that the number of titles forming a "nucleus" of bibliographical tools will be less than a "nucleus" of primary journals.

Other curves (figures 3 to 6) were plotted when source journals were removed from the total of 17 source journals and citation frequencies of cited titles re-calculated. This was done in order to test the effect of the exclusion of disciplines from the source journals on the list of cited titles (these tests are reported in detail in 2.5.5), but the scatter of citations across journals for each curve is discussed below. The slopes of these curves, together with the parameters "s" and "c" are reported in

Table 2. The first column refers to the subject which was removed from the group of source journals for each calculation.

TABLE 2
PARAMETERS OF BRADFORD CURVES RELATING CUMULATIVE NUMBER OF CITATIONS TO NUMBER OF JOURNALS (Figures 1, 3, 4, 5 and 6)

	Parameters of curves			
Data base with discipline excluded	Slope	s	c	"e" x "s"
None excluded	.76	4.7	17	12.4
Criminology	.54	4.3	15	11.7
Psychology	.63	3.8	15	10.3
Sociology	.57	3.9	12	10.6
Economics	.64	4.9	30	13.3

The removal of a source journal will obviously affect the absolute number of journals cited, but the scatter of the remaining citations may remain much the same. The results given in Table 2 indicate that this was not so because the slopes of the curves differ. The removal of source journals in any of the disciplines resulted in a decrease in the value of the slope of the curve, indicating that the scatter of citations across journals was increased. This result is difficult to interpret, especially as the slope changed most when the one source journal in criminology was removed. The best fit straight line for the curves was difficult to assess (see footnote 3 on p. 18) and a detailed consideration of this analysis will be left until the slope can be more accurately calculated in the main study.

The effect upon the parameters "s" and "c" of removing source journals is more clear-cut. When source journals in either criminology, psychology, or sociology were removed, the size of the core in the group of social sciences was decreased slightly, as indicated by both the values of "c" and "e" x "s". When economics source journals were removed the size of the core was increased by a substantial amount, indicating that the source journals in economics provide a tightly knit group of citations to relatively few cited journal titles that occur high in the frequency list of all citations. However, these changes in the parameters

of the Bradford curve are fairly small, and the results of this analysis give only a limited insight into the way in which the citations are behaving. A much more clear-cut finding about the citation pattern across the social science disciplines is reported in 2.5.5. Lists of frequently cited titles were calculated after the removal of each of the major social science disciplines in turn. It was shown that economics behaved very differently from the other social sciences.

Another way of looking at the distribution of citations across the literature is to measure the number of journals that are needed to account for a given percentage of the citations. This calculation has been made frequently for science literature in the context of discussion about the optimum size of journal collections (e.g. Brookes, 1971).

For the 222 journals cited twice or more in the pilot study, 50 per cent of all citations to these journals were found in 33 journals (14.9 per cent) and 90 per cent of all citations were found in 160 journals (72.1 per cent). If these calculations are performed upon all the citations (397 titles were cited once only) obviously the 50 and 90 per cent levels will cover a larger number, but a smaller proportion of, journal titles[1]. The figures for this calculation are given in Table 3, together with figures for the 75 per cent level, in order to facilitate comparison with some of the studies in science, listed in Table 4, which report the 75 per cent level only.

TABLE 3
SCATTER OF CITATIONS ACROSS JOURNALS IN PILOT STUDY

Data base	% of journals accounting for 50%, 75%, and 90% of citations		
	50	75	90
222 journals cited twice or more	14.9	40.5	72.1
All 619 journals cited in pilot study	10.5	34.3	73.6

Vickery (1961) compared the results of citation studies in the fields of chemistry, physics, biochemistry, bacteriology, electrical

[1] Most analyses of scatter use as a base for calculating 50, 75 and 90 per cent levels all titles that are cited, not all titles in the subject field. The base used in Table 3 is derived from the number of titles cited, and not the total number of titles in the social sciences, many of which are not cited at all. The measure of scatter would obviously be smaller if expressed as a percentage of the total number of journals that could be cited.

engineering and applied geophysics from data reported by Stevens (1953), Coile (1952), and Munn (1956), and found that about 75 per cent of citations were to 10 per cent of journals in each field on average. There were, however, fairly large variations from one subject to another, as can be seen from Table 4, based on Vickery's (1961, p.265) review of citation studies, with other studies added as indicated.

TABLE 4

SCATTER OF CITATIONS ACROSS JOURNALS IN OTHER FIELDS

(Based on Vickery, 1961; from data by Stevens, 1953, Coile, 1952, and Munn, 1956. Last 7 entries taken from miscellaneous sources as indicated in footnotes)

Subject field	Date of Study	% of journals containing 50% and 75% of citations	
		50%	75%
Chemistry	1927	2.8	10.0
Chemistry	1939	3.8	14.0
Physics	1939	2.3	13.0
Biochemistry	1938	1.4	6.5
Biochemistry	1954	3.2	*
Bacteriology	1954	5.0	*
Electrical Engineering	1949	6.0	12.0
Applied Geophysics	1934	8.3	26.0
Lubrication	1934	13.0	38.0
Tissue Culture	1953	8.5	41.0
Helium	1947	3.3	17.0
L.S.H.	1931-5	16.0	34.0
Petroleum	1958	7.0	25.0
Endocrinology[1]	1965	*	14.0
Electrical Engineering[2]	1969	*	13.0
Chemical Engineering[3]	1959	*	17.0
Mechanical Engineering[3]	1959	*	17.0
Metallurgical Engineering[3]	1959	*	12.0
Geology[4]	1969	*	30.0
Physics[5]	1962	*	2.0′
Biomedicine[6]	1964	4.0	36.0≠

* Data not available

′ Accounting for 84% of citations

≠ Accounting for 90% of citations

Figures could not be calculated for the 90 per cent level on the basis of the data reported by Vickery (1961), but it can be concluded that as far as the physical and biological sciences are concerned, the scatter of citations across journals is much less than in the social sciences.

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[1] Kourilova (1965)

[2] Coile (1969): IEEE publications cited in IEEE publications

[3] Burton (1959)

[4] Kessler and Heart (1962): journals cited in Physical Review

[5] Craig (1969)

[6] Orr and Leeds (1964)

The scatter of citations in electrical engineering and applied geophysics is higher, and in the case of the applied sciences of lubrication, petroleum, and L.S.H., much higher than in the "pure" sciences, but even so, the scatter in these fields is lower than in the social sciences.

There has been very little work on the scatter of citations in the social sciences. Data reported by Wood and Bower (1969) from a study of requests[1] for journals at the National Lending Library for Science and Technology (NLLST) is relevant to the question of scatter. From the Wood and Bower data that relates the cumulative percentage of total requests for social science serials to number of serial titles, it is possible to estimate that 50 per cent of requests were for 16 per cent of titles and 90 per cent of requests for 66 per cent of titles. It is unlikely that requests for interlibrary borrowings match exactly citation patterns: nevertheless, these figures are similar to the figures obtained in the present study of 14.9 per cent and 72.1 per cent for the 50 per cent and 90 per cent levels, and appreciably higher than measures of scatter of citation in science.

2.5.5 Relationship between source journals and cited journals

The effect of source journals upon the number, type, and structure of citations was examined by dividing the source journals into two groups at random and providing frequency lists of cited titles for each group. The results are given in Appendix 9. A further test of the effect of source journals upon cited journals was made by removing from the list of source journals groups of journals according to subject grouping, and re-calculating the distribution of citations across journal titles. In the main this procedure had a negligible effect upon the slope of the curve, although the point at which the projection of the straight line met the X-axis was affected. These results are presented in Appendix 10. The implications of these findings are discussed below.

The results of these analyses did not give unequivocal evidence about the effect of source journals on cited titles, although it was shown that the method of analysis was appropriate and it was decided to perform a similar analysis with the data from the main citation study.

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[1] Goffman and Morris (1970) have shown that the Bradford Law holds for the circulation of journals as well as for the dispersion of citations across journals. Very few journals are requested frequently and very many are requested infrequently.

The correlation coefficient[1] between the frequencies of cited titles obtained when the 17 source journals were divided into two groups was -0.12 when the first 26 titles in the frequency lists common to both lists A and B were used, and -0.33 when all the 207 journal titles common to lists A and B were used in the calculation. The first correlation[2] is not significant but the second[3] one is very significant (See Appendix 9 for details).

This test of the effect of source journal titles upon the lists of cited titles was on a very small number of source journals and the subject composition of the source journals in Groups A and B was quite different. This is reflected in the subject classification of the cited journals. American Sociological Review is the only cited title that occurs frequently in both lists: it is ranked first in Group A and third in Group B. The 10 most frequently cited journals in Group A are mainly from the fields of sociology, economics, and political science, although it is interesting to see that Science is ranked seventh and British Journal of the Philosophy of Science eleventh equal. In Group B nearly all the top-ranking cited titles are in psychology with the exception of American Sociological Review ranked third, Review of Economic Studies ranked sixth equal, and Nature ranked tenth.

Considering the very different composition of sub-groups A and B, the number of titles that are common to the two cited lists is surprising. It is almost certain that much larger groups of source journals would result in frequency lists which were significantly positively correlated.

Further attempts to establish the relationship between source and cited journal titles were made by removing from the source list journals in each of the major disciplines and re-calculating the list of cited titles. This was done separately for psychology, criminology, sociology and economics. For each calculation, the titles that had been removed for the previous calculation were replaced and only titles from the discipline in question were removed: for example, when calculating the frequency list of cited titles with source journals in sociology removed, the source journal in criminology which had been removed for

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[1] Spearman ranked order correlation with correction factor for tied ranks. When no correction factor was applied the value of the coefficient for the 207 journal titles fell from -0.33 to -0.24.

[2] $t = 0.59$. Not significant (two-tail test)

[3] $t = 5.04$. Significant at 0.01 level (two-tail test)

the previous calculation was included. The data are reported in Appendix 10.

If a group of source journals makes an equal contribution to all fields in the social sciences - this is highly improbable - and also makes a contribution to all cited titles, the removal of this group of source journals would have a negligible effect upon the order of cited journals in a frequency list. On the other hand, if, for example, sociology journals make citations only to sociology journals, the effect of removing sociology journals from the source journals would be to remove, in the main, sociology journals from the list of cited journals - assuming that journals in other disciplines rarely cite material in sociology journals.

This test gives an indication of the degree of scatter of citations across the major social science boundaries, and therefore can give an indication of the extent to which the social science disciplines are integrated.

The first test involved the removal of the British Journal of Criminology from the list of source journals. This had a negligible effect upon the list of ranked journals according to frequency of citation. This source journal cited American Sociological Review twice, and cited once each Psychological Bulletin, American Journal of Sociology, Journal of Abnormal and Social Psychology, and Nature. Although there were 273 citations gathered from the British Journal of Criminology - and only 6 were self-citations - the number of citations it makes to the most frequently cited social science journals is surprisingly small. The remaining 200 or so citations gathered from British Journal of Criminology were thinly spread across a large number of journals, infrequently cited by other source journals. It would appear that criminology as represented by British Journal of Criminology is dependent upon a large number of social science journals.

The second test involved the removal of psychology journals from the sources. This had a marked effect upon the ranked list of cited titles. The first effect, as predicted, was to remove the psychology journals from the very high positions they had previously occupied on the frequency list. In the ranked list of journal titles based upon

citations in all the source journals, five of the ten most frequently cited journals were in psychology. When psychology was removed from the sources, only Journal of Experimental Psychology remained in the list of ten most frequently cited journals. However, psychology journals remained very prominent: Journal of Experimental Psychology (17 citations), Quarterly Journal of Experimental Psychology (13), Zeitschrift für Angewandte Psychologie (8), Journal of Abnormal and Social Psychology (8), and Psychologische Arbeiten (5) occurred in the new list of the 50 most frequently cited titles - although with a reduced frequency of citation - indicating that journals in other social sciences make a substantial number of citations to psychology.

It was also noted that psychology derived some of its material from the other social sciences: for example, 13 of the citations in the psychology journals were to American Sociological Review, 2 citations to American Journal of Sociology, 6 to Science and 15 to Nature. Hence, to some extent psychology draws upon sociology, and further, psychology accounts for over half of the citations recorded from all the source journals to Science and Nature. This is to be expected because of the special position of psychology as a social science in its relationship with the physical and biological sciences. However, the data shows that psychology is closely connected with some of the other social sciences and can very justifiably be classified as a social science proper. Very few citations in the psychology journals were to the journals in anthropology, economics, and social studies that occurred in the list of the 50 most frequently cited journals.

It is interesting to note that the three[1] "academic" psychology source journals included on the list of source journals make no citations to British Journal of Delinquency, Journal of Consulting and Clinical Psychology, International Journal of Social Psychiatry, Journal of Social Issues, and Journal of the American Medical Association. All these journals are cited fairly frequently by other social sciences. Psychology obviously does not derive material from these applied areas. It would be interesting to know the extent to which applied fields bordering upon psychology draw upon mainstream psychology. It may be possible in further work to collect some additional data from source journals in medicine, psychiatry, child psychology, etc.

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[1] American Psychologist, British Journal of Psychology and Psychologische Forschung

The third test involved the removal of sociology journals from the list of source journals. This produced a frequency list of cited titles dominated by psychology, but even so, the three most cited sociology journals - American Sociological Review, American Journal of Sociology, and Social Forces - remained high in the list of cited titles when sociology journals were removed. In fact, American Sociological Review received 19, Social Forces 13, and American Journal of Sociology 12 citations from other social sciences. Human Organization, which occurred in the first 50 most frequently cited titles for the complete list of source journals, did not occur in the list of 50 most cited titles when sociology sources were removed.

The source sociology journals included some citations to journals in economics, psychology and other subjects. For example, there were four citations to Economic Journal, four citations to Journal of Abnormal and Social Psychology, and one citation each to 12 of the 50 most frequently cited journals in economics, politics, and psychology. Sociology journals also included a few citations to Nature and Science.

Finally, a frequency list of cited journals was compiled for the data when source journals in economics were removed. This had the most dramatic effect of all the tests. The original list of 50 most frequently cited journals contained as many as 30 in economics, in addition to Journal of the Royal Statistical Society. When economic journals were removed from the source list, only two economics journals remained in the list of 50 most frequently cited journals, and these were in applied economics, Économie Appliquée and Medical Economics. The latter received no citations from the economics journals and Économie Appliquée received an equal number of citations (7) from both mainstream economics journals and other source journals.

In contrast to psychology and sociology, economics is very much self-contained: journals in economics rarely cite journals in the other social sciences, and only very few citations are made to economics from the other social sciences. From the data reported, it is possible to calculate the number of journals in psychology and sociology which cite economics. The removal of psychology source journals had no effect at all on the frequency of citation of the 13 most frequently cited economics journals. In the case of sociology there were four citations

to Economic Journal, and one citation each to Journal of Political Economy, American Economic Review, Economica and Canadian Journal of Economics and Political Science. It was established that the sociology journals frequently cited medical economics.

Economics is rightly considered to be one of the major social science disciplines, but the present analysis demonstrates that it is in no way closely tied, in terms of citations across disciplines, to the other social sciences, as is the case, for example, with psychology or sociology. Psychology is sometimes regarded as a doubtful social science subject, having greater affinity with the physical and biological sciences. However, the present data suggests that psychology forms an integral part of the social sciences.

Perhaps the most interesting tentative finding is the absence of citation in some of the major social science journals to journals in applied fields. It is hoped that further citation data can be gathered, from source journals in a number of applied and interdisciplinary fields such as medical economics, in order to establish the extent to which applied fields in the social sciences derive their material from "academic" social science journals.

2.5.6 Citations from social science to other fields and citations from other fields to social science

One of the objectives of DISISS is to establish the extent of citations from the social sciences to fields bordering on the social sciences, or in some way related to them such as history, medicine, environmental studies, and the extent of citations from other fields to social science material.

It would be of some interest to establish the extent to which all disciplines cite social sciences material. A study of this scale is out of the question for DISISS: moreover, it is suspected that many sciences (e.g. physics, chemistry, botany) make extremely little use of social science material. It was therefore decided to concentrate upon fields that have demonstrable links with the social sciences (e.g. medicine, ergonomics, management), and fields in which either social

scientists have shown much interest in the last decade or scientists have shown an interest in the social sciences (e.g. history, environmental studies, science policy, international relations).

Citation studies are planned in the fields of history and medicine to establish the extent to which citations in these fields are to the social sciences. Also the citation data will be analysed to show the extent to which citations in social science journals and monographs are to fields outside the social sciences. The citation analyses in medicine and history depend upon the cooperation of two library schools in the United Kingdom, and there is only a small probability that the study will be completed with the resources available to DISISS if cooperation is not forthcoming.

One of the largest citation studies of the relationship between subjects is by Earle and Vickery (1969), dealing in detail with subject relations in science and technology and including some data of relevance to the social sciences. This study is now considered, and then the pilot study list of cited journals will be compared with lists of cited journals, lists of holdings of journals in science and medical libraries, and bibliographies in science, medicine, and applied science to estimate the extent to which citations taken from social science sources are to other sources. This analysis is rudimentary compared to the Earle and Vickery study, but gives some indication of subject relations involving the social sciences and points the way to future studies of subject relations.

Earle and Vickery (1969) took a representative sample of recent UK publications and recorded all citations in these publications. Source items were taken from the 1965 volume of British National Bibliography and the 1965 edition of Toase Guide to Current British Periodicals. Items were drawn only from Dewey classes 300 (Social Science, but excluding 340, Law and Public Administration), 500 (Science), and 600 (Technology, excluding 640, Domestic Science).

In looking at the relations between subjects, the data from class 300 was not analysed as fully as from classes 500 and 600. For example, it was possible to show that 70 per cent of citations from

science were to science subjects and only 1 per cent to subjects other than science and technology, but the number of citations from social science to social science was not calculated, although it was noted that 9 per cent of citations from social science were to science subjects and 9 per cent to technology. Since science makes only 1 per cent of citations to subjects other than science and technology, and only 5 per cent of citations in technology are to classes other than technology or science, it can be concluded that neither science nor technology make many citations to social science. On the other hand, 9 per cent of citations in social science are to science and 9 per cent to technology. Hence, in looking for subject relations between social science and other subjects it would seem to be more profitable to look for citations from social science to other subjects, rather than citations from other subjects to social science. A full study of the subject relations within the social sciences is of course required because this is not included in the Earle and Vickery study.

Earle and Vickery give details about the total number of cited items, expressed as a percentage of all cited items, and also as a percentage of items in source subjects only. These data are reported fairly fully for the science and technological subjects as well as for the major social sciences. The average number of citations for each source item is also given, and this varies enormously, although on average there are fewer citations per source item in social science than in science.

The results of the pilot citation study are compared now with the results of citation studies in history and in medicine - although there are extremely few citation studies in these fields. Where frequency lists of journals or monographs exist it is possible to identify the titles that are in common between those lists and the pilot study list of cited titles.

A citation study has recently been reported in the field of history by Jones, Chapman, and Woods (1972) in which approximately 7,000 citations were taken from seven history journals, said by the authors to be leading titles in the field of British history, and published in 1968 and 1969. The list of journals most frequently

cited (self-citations included) was compared with the list of 397 journals cited in 17 source journals in the pilot study. There were only four titles in common; namely, English Historical Review, American Historical Review, Edinburgh Review, and Journal of the Royal Statistical Society. The first three of these journals were cited each once only in the pilot study, and the Journal of the Royal Statistical Society was cited 13 times.

It is apparent that social scientists are making extremely little use of the history periodical literature. However, it must be remembered that the Jones et al. study was concerned with mediaeval, early modern, and late modern history. The type of historical material that social scientists require is unlikely to be found in the core periodical literature of history. There is no doubt that social scientists are increasingly making use of certain types of historical material. In the INFROSS study (Bath University, 1971) for example the majority of social scientists responding to the questionnaire made some use of historical material in their research. Political scientists were heavy users of historical material, and geographers, economists and sociologists made many demands for this type of material: 31 per cent of the economists often used historical material; the figures for geography and sociology were 39 per cent and 29 per cent respectively. Psychologists made extremely little, and anthropologists only moderate, use of historical material. Unfortunately, INFROSS was not able to identify the sources of historical information, but it would appear that social scientists interpreted historical information to mean manuscripts, statistics, collections of letters, etc. rather than the periodical literature of history. These types of data are also the raw materials for the historian. It would seem that historians and social scientists have a need for raw materials in the form of manuscripts, collections of letters, etc., but thereafter their communication paths diverge; the historian publishes in history journals, and the social scientist publishes in social science journals. At the level of formal communication there would appear to be little overlap. A more detailed study of the materials used by social scientists and historians would perhaps show a greater similarity.

The number of citations in social science journals to the literature of medicine and related fields was assessed by counting the number of journals in common between the pilot study list of cited journals and selected bibliographies in medicine and lists of cited titles in medicine. Surprisingly, very few citation studies have appeared in medicine, and it is therefore impossible to establish accurately the extent to which medical scientists cite social science material, although medical libraries provide social science material: for example, Mackenzie and Bloomquist (1964) show that many social science journals are held by the Harvard Medical Library, and 131 titles on the Harvard list are on the pilot study list of cited titles.

Other comparisons involving medicine, biomedicine and social science show that relatively few titles in medicine appear in the pilot study list of cited titles. There are 5 titles in common between the Wood and Bower (1970) list of biomedical serials most often loaned by the NLLST and the pilot study list. In another study by Ash and Bruette (1966) of interlibrary transactions 10 of the most frequently requested medical titles appear on the pilot study list. These include general science titles (Annals of the New York Academy of Sciences, Nature, and Science), the journals of the American and British Medical Associations (Journal of the American Medical Association and Lancet), and psychology and psychiatry journals (American Journal of Psychiatry, American Journal of Orthopsychiatry, Brain, International Journal of Psychoanalysis, American Journal of Abnormal and Social Psychology, etc.) There was no title in common between the pilot study list and the list of journals prepared by Orr and Leeds (164) containing documents generated in 1961-1962 by National Institute of Health staff and grantees. Frick and Ginski (1970) identified 78 journals which made direct reference in their titles to some aspect of the cardiovascular system, but none of these titles appear on the pilot study list. A very old citation study in medicine by Jenkins (1931) gave a list of the 50 most frequently cited titles in 3 medical source journals, but only two of these titles (Journal of the American Medical Association and Lancet) appear in the pilot study list.

It can be concluded that social scientists make some use of the more general medical journals, but no use of medical journals dealing mainly with a single aspect of medicine. Social scientists, in common with medical scientists, have a need for the general science journals.

2.5.7 Journal self-citation

Self-citations could be collected only for the source journals. The pilot study did not set out to study specifically the phenomenon of self-citation, although it is interesting to rank the source journals according to frequency of self-citation and to compare this list with other studies. Self-citations were calculated as a percentage of total citations for each journal and the figures are given in Appendix 6b. The rank order of journals according to percentage of self-citations is given in Table 5.

TABLE 5

RANK LIST OF JOURNALS ACCORDING TO PERCENTAGE OF SELF-CITATIONS

Rank	Journal Title	Percentage of self-citations
1	American Psychologist	14
2	American Anthropologist	12
3	American Political Science Review	11
4	Economic Journal	10
5 =	Economica	8
5 =	British Journal of Psychology	8
7 =	American Journal of Sociology	5
7 =	American Sociological Review	5
9	Revue Économique	4
10 =	British Journal of Sociology	3
10 =	Psychologische Forschung	3
12 =	Australian Journal of Politics and History	2
12 =	British Journal of Criminology	2
12 =	Parliamentary Affairs	2
12 =	Social Service Quarterly	2
12 =	Sociological Review	2

Although self-citation is an interesting and researched phenomenon in itself, its main relevance for the present study is the effect that it has upon frequency lists of cited journals. The overall effect of including or discarding self-citations is almost negligible (see Appendices 6 and 8). Obviously the inclusion of self-citations brings each of the source journals slightly higher in the ranked list of titles. All but one of the source journals in the pilot study had some self-citations and this means that the exact arrangement of journals in the frequency list is to some extent affected by self-citation, although the number of self-citations as a percentage of total citations received by each source journal was low. The percentage of self-citations for American Psychologist, ranked first in Table 4, was only 14.

It has been suggested that the status of a journal is related to the percentage of the citations that are to itself, with high status journals having a tendency to make more self-citations than low status journals. Boll (1952) found in the field of psychology that Journal of Experimental Psychology and the Journal of Comparative and Physiological Psychology rated high on a measure of self-citation. Xhignesse and Osgood (1967) re-worked some of Boll's data for titles published in 1955 and confirmed the previous finding that the Journal of Experimental Psychology made more self-citations than other journals. In another study, Jakobovits and Osgood (1967) found that Journal of Experimental Psychology was rated by psychologists as a high status journal. Two review type journals, Psychological Review and Psychological Bulletin, contained relatively few self-citations, 12 per cent and 3 per cent of all citations contained in these journal titles respectively.

From the work that was done in the period preceding the mid-1960s it could be concluded that self-citation was related to the status of a journal and to the type of journal (for example, review journals tending to make fewer self-citations than those reporting the result of primary research). However, recent work on self-citations suggests that high self-citation may indicate that a field or a journal (sometimes only one journal may be available in a new field) exists in isolation from major disciplines. Krantz (1972) showed that in the relatively new field of operant psychology (which came into being in the 1930s

and which has had a journal devoted to it since 1958 - Journal of the Experimental Analysis of Behavior) there was a consistent increase in self-citations (to this journal) during the 10-year period 1958-69. During the same period, a more general psychology journal, going back much further in time, Journal of Experimental Psychology, showed a slight decrease in self-citation. Further evidence of isolation[1] of the field of operant psychology came from a study, also reported by Krantz (1972), of the citations made to JEAB in two general textbooks on psychology. The number of citations to JEAB as a percentage of all citations was smaller than citations made to another specialist field in psychology, verbal learning, represented by Journal of Verbal Learning and Verbal Behavior.

The evidence about self-citation is equivocal, and it is difficult to interpret the present findings in the light of conflicting findings from other studies. The range of self-citations in the present study is not very large - the largest percentage of self-citation was in American Psychologist where 14 per cent of the citations were self-citations. However, some explanation can be attempted. It is possible that the relatively high percentage of self-citations in American Anthropology is due to the isolation of this field relative to the other social sciences; but the similar percentage of self-citations in American Psychologist can hardly be explained in this manner. For the smaller disciplines, such as criminology and social studies, infrequent self-citation could indicate that these areas draw heavily upon material from the main social science disciplines: that is, they can be regarded as subdisciplines, drawing upon more basic disciplines (for example, criminology on psychology and law, social studies on psychology, sociology, etc.) This would account for the few self-citations found in British Journal of Criminology and Social Service Quarterly. On the other hand, low self-citation may mean that citations are to other journals in the

[1] In contrast to the field of operant psychology, Shulman and Silverman (1972) reported a very different state of affairs in social psychology. They measured the distribution of citations in Journal of Personality and Social Psychology for the years 1965, 1966, and 1967 and found that less than 6 per cent of the 2,000 cited references appeared more than twice. It was concluded that the field of social psychology was extremely diverse, drawing upon many other areas, both mainstream psychology and other fields. A similar conclusion was reached by Komorita (1968) from a study of social psychology textbooks. It is unfortunate that neither of these studies reported the percentage of self-citations found in the social psychology literature.

same discipline rather than to other fields. This may be the case with Australian Journal of Politics and History, Parliamentary Affairs, and Sociological Review.

More data is needed to indicate which interpretation is most appropriate. In the pilot study only 37 citations were taken from American Sociological Review (2 were self-citations) - hardly enough to draw conclusions about self-citations - and only very few self-citations occurred in Australian Journal of Politics and History (7 self-citations), British Journal of Criminology (6), Parliamentary Affairs (3), Social Service Quarterly (4), and Sociological Review (4). A study of the characteristics of self-citation in these journals would need considerably more data before reliable conclusions could be drawn.

It is very clear that journal self-citation is much less in the social sciences than in science. The figures reported from studies of self-citation in science subjects vary enormously, but a fairly representative figure based upon a large number of counts from Science Citation Index by Garfield and Sher (1963) is 20 per cent. Some very high figures have been reported for individual journals: for example, Meadows (1967) found that 40-50 per cent of citations in Astrophysics Journal were self-citations, and Jones, Chapman, and Woods (1972) found similar figures for history journals. This is in striking contrast to the 14 per cent - the highest degree of self-citation found - in the present study.

Journal self-citation is obviously related to the scatter of citations across journals. The relatively low degree of self-citation in the social sciences is in keeping with the fact (discussed in 2.5.4) that the scatter of literature in the social sciences across journals is greater than the average degree of scatter in science.

2.6 Conclusions

The pilot study provided valuable data relating to: (a) frequency of citation of social science journal titles; (b) relative frequency of citation of journal and monograph titles; (c) the distribution of citations across journals; (d) proportion of self-citations; (e) effect

of source journals on list of cited titles; and (f) forms of literature cited.

The experience gained in the pilot study proved valuable in the design of the main citation study; a fairly exact estimate of the number of citations that could be collected with the resources available was calculated and the frequency list of cited titles provided one of the sampling frames from which journal titles could be taken for use as source titles in the main study.

The pilot study provided data on a number of fields (e.g. date, language) which were not included in the modified record form used in the main study. The analyses performed on these fields will be reported in another working paper.

3.0 MAIN CITATION STUDY

3.1 Introduction

The greater part of the data for the citation file was collected in 1972. Citations were again gathered from journal articles, and in addition citations were available from some of the social science journals covered by Science Citation Index.

Most of the results and analyses of the main citation study will be reported in another working paper. In the present paper the planning of the study is reported, and attention is paid especially to the selection of source journals, as this was influenced greatly by the results of the pilot study.

Some preliminary calculations have been made on the data, including a breakdown of source journals according to country of origin, and some 27,000 citations of the 40,000 citations collected in the main study have been analysed according to subject. These analyses are reported in 3.6.

3.2 Social science journals covered by ISI tapes[1]

In order to make use of citations on ISI tapes it was first necessary to identify the social science journals included on ISI tapes. A list of titles common to CLOSSS and ISI Source Publication list was compiled: this is reported in Appendix 11a, and in Appendix 11b where the titles are classified according to the main social science disciplines. Forty per cent of the journals common to CLOSSS and the ISI Source Publication list were classified as psychology, 10 per cent as sociology; only very few fell within each of the other social sciences.

In order to get an estimate of the social science titles covered by SCI, the list published by ISI of titles covered in 1970 was scanned for social science titles; subject headings listed by ISI were used, and the result of this search is given in Appendix 11c. In the case of all subjects except psychology and library science, less than 1 per cent of the titles covered in SCI in 1970 were in any one of the social science disciplines (each subject classification was exclusive): approximately 3 per cent of titles covered by SCI were in psychology. A total of 6.8 per cent of titles covered by SCI were classified by ISI as social science.

It was noted that 78 per cent of the 222 most frequently cited titles in the pilot study were available on ISI source tapes for the third quarter of 1971. It was estimated that the cost of taking citations from ISI tapes was less than the cost of gathering citations by hand from source journals, and established that the ISI citation data could be made available for preliminary test runs of the clustering program earlier than the citations gathered by hand, for which a machine file has to be created.

It cannot be assumed that the social science titles covered by ISI source tapes are representative of the social science disciplines. Although it may make sense to use the ISI list of source titles as a

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[1] ISI (Institute for Scientific Information) produce in machine readable form listings of sources used in the construction of the Science Citation Index (SCI) and of the citations that are taken from these sources. DISISS had access to these tapes covering the third quarter of 1971.

sampling frame for citation studies of science, it is quite unsuitable for the social sciences. Further, although psychology is relatively well covered by SCI, there is no indication that the psychology journals covered are a representative sample. When ISI publish[1] in 1973 Social Science Citation Index the ISI source tapes will be much more nearly representative of the social sciences.

The ISI sources have been regarded rather as a convenient way to obtain citation data rather than as a means of obtaining adequate coverage of social science disciplines. The closest approximation to a complete list of social science journal titles is CLOSSS, and this was used as one of the sampling frames.

3.3 Sampling source journals

Two methods of obtaining a sample of source journals, apart from the ISI source tapes, were considered. These were: (i) sampling at random from CLOSSS; and (ii) sampling from the frequency list of journal titles produced in the pilot citation study. Both methods have advantages and disadvantages, and these are discussed below.

Sampling at random from CLOSSS guarantees a fairly representative cross-section of social science journal titles. CLOSSS is probably the largest listing of social science serials in existence; therefore a large random sample from CLOSSS should ensure a good coverage of the social sciences. However, its size is a disadvantage if a relatively small sample is taken, because a large number of titles in any random sample taken from CLOSSS will be relatively infrequently used, and often of peripheral value to the social sciences because the number of core journals in CLOSSS will be a small percentage of the total. Also, CLOSSS contains many titles that include social science material but would not be considered social science journals. However, random sampling from CLOSSS was considered to be attractive because a great range of titles across all the social sciences can be obtained. At the same time, a disadvantage was present because a large number of the source titles

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[1] See Garfield (1972a), Weinstock (1972).

drawn at random will be cited relatively infrequently (if at all) in the frequency list of cited titles. For the work on clustering it is necessary to have titles citing each other fairly frequently. Hence, it may not be possible to use all the citation data for the cluster analyses.

A random selection of 100 titles was drawn from CLOSSS (Appendix 12). The predictions that were made about a random sample from a very large universe of titles were fairly accurate. For example, only 11 titles from the first 222 most frequently cited titles in the pilot study appeared on the list of 100 titles drawn at random. A large number of the titles were peripheral to the social sciences (e.g. Asia, Pacific Record, Agricultural Education Magazine, Smokeless Air, Arab Views), and some could not really be regarded as social science at all (e.g. College and Research Libraries, UNESCO Bulletin for Libraries).

Obviously the random sample reflects to some extent decisions made about titles to be included in CLOSSS. The general procedure was to include all titles which contained a fair proportion of material obviously relevant to the social sciences: when in doubt titles were included. However, even if the criteria for inclusion of titles in CLOSSS had been more restrictive, a relatively small sample of about 100 titles drawn at random from a relatively large universe of titles would still have contained few well-known and frequently cited titles.

Using the most frequently cited journals was an attractive alternative, especially from the point of view of the clustering experiments, because this method ensures that each of the source titles occurs relatively frequently as a cited title and that the number of obscure titles is reduced. However, there are some general problems in using frequently cited journals as sources for a citation study. In addition, there were problems specific to the list of cited journals produced in the pilot study.

If one objective of a citation study is to compile a list of frequently cited journals, thereby establishing the "core" journals of a discipline, then selecting source journals that are frequently cited, or used, or well known, will obviously limit the range of journals that

appear in a derived frequency list. It is known that there is a concentration of citation upon a relatively small number of journal titles. It is not known if this concentration upon a small number of journal titles would be found in articles appearing in infrequently used and relatively unknown journals, because most Bradford curves have been based upon data from relatively well known journals. Another major criticism of selecting source journals from a list of frequently cited titles is that the method is biased in favour of finding a fairly clearly defined structure in the citation patterns. Finally, at a general level, it is difficult to ensure that the whole field of the social sciences is adequately covered by a relatively small number of source journals. In the pilot study the omission from the list of source journals of major disciplines such as education and geography meant that these disciplines were under-represented in the list of cited titles, although some journals in these disciplines were cited by journals in the disciplines covered by the source journals.

In order to show the extent to which the list of cited titles obtained in the pilot study represents all the social science disciplines, a rough subject classification of the first 100 most frequently cited titles was made, and is given below in Table 6.

TABLE 6

SUBJECT CLASSIFICATION OF 100 MOST FREQUENTLY CITED JOURNALS

Subject	No. of journals
Psychology	44
Economics	15
Non social science	11
Sociology	10
Politics	6
Social science general	5
Area studies	4
Anthropology	4
Not classified	4
History	1
Education	1
Linguistics	1

Psychology, economics, sociology, politics and anthropology were included as subject fields in the 17 source journals and their predominance in the list of cited journal titles is to be expected.

If source journals for the main citation study had been drawn only from the list of frequently cited titles derived from the pilot study, the fields of education, linguistics, history and geography would have been poorly represented. Plans were made for representing these disciplines in the list of source journals used for the main study.

If a random sample of frequently cited titles, or if the first 50 or 100 most frequently cited titles had been taken as the source journals for the main citation study, psychology would have predominated: therefore, a method of weighting journal titles according to a measure based upon the number of journals in each of the major social sciences was considered. In this way the predominance of psychology journals in the pilot study frequency list could have been avoided. However, the preliminary work on weighting proved unsatisfactory. The major problem was the huge variation in the value of the weighting functions[1] derived from 4 major listings of social science journals - Woodworth, WLOSSP, Ulrich, and CLOSSS. For example, education and commerce receive a very high weighting if the factor is based upon the Woodworth list and an extremely low weighting if based upon WLOSSP. A weighting factor for psychology is fairly large if based on CLOSSS but small if based on Woodworth. These variations from one listing to another arise because of the uneven coverage of the social sciences and the different classifications used by each of the bibliographies. The use of a weighting factor would have introduced into the citation study a number of problems associated with the classification of material in the social sciences: these were problems that DISISS wanted to avoid.

It was decided, in the end, to use as sources for the main citation study the first 50 most frequently cited titles in the pilot study, and 50 titles drawn at random from CLOSSS. This enabled a comparison to be made between the results obtained from these two major source lists, for example, a comparison of clusters, frequency lists of titles, authors, etc.; and at the same time it is possible to combine the results from these two major lists in the clustering experiments and the other analyses.

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[1] See Appendix 2

There still remained the necessity of obtaining source journals from the fields not represented in the pilot study: namely, geography, education, history, linguistics, and management. History was considered to be outside the main interest of DISISS, although a separate part of the project is concerned with the relationship between history and the social sciences (to be reported in another working paper). Linguistics was considered to stand apart from the main body of the social sciences and therefore was not given high priority. There remained the necessity of obtaining source journals from management, education, and geography.

The ideal solution would have been another pilot study to obtain a frequency list of cited titles in a small number of source journals in management, geography, and education. It was not possible to do this and a compromise solution involved the compilation of a list of important and frequently used journals in each of these disciplines identified by social science librarians. This list is given in Appendix 13.

If previous citation studies had been available in the fields of management, education, and geography it would have been possible to have selected frequently cited titles for use as source journals. Although extensive enquiries were made, few suitable studies were found. The citation study by Clayton (1969) included as part of a study of Geo Abstracts was ruled out because of its emphasis upon physical geography. The study of management and business literature by Dews and Ford (1969) included a list[1] of journals mentioned ten or more times by users. A second list[2] in Dews and Ford (1969) contains primary journal titles covered by ten or more abstracting services, although, as Dews[3] points out, this list is now somewhat out-of-date, because this field is one of very rapid

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[1] Dews has pointed out (personal communications) that the list of journals mentioned by users may not be entirely representative of the field of management and business studies because of the nature of the sample of users.

[2] It is interesting to see in the Dews and Ford (1969) report that the list of periodicals mentioned ten or more times by users does not include the same titles as the list of periodicals covered by ten or more documentation services. This may be due in part to the nature of users included in the sample. It does of course illustrate further the problem of selecting source journals.

[3] Personal communication.

growth; for example, in 1971, 27 per cent of the 500 or so periodicals subscribed to by the Manchester Business School had commenced publication since 1965. This represents an average of 23 new titles per year.

A sample of six journals in management and business studies was drawn from the list (Table 32) in Dews and Ford (1969) of periodicals covered by ten or more documentation services: only titles noted as falling within the field of management and business studies were included. Journal titles not directly concerned with management functions were not included. These titles are given in the supplementary list of journal titles in Appendix 14.

The list of social science journals (Appendix 13) judged to be important by social science librarians provided a very convenient way of filling in the gaps in the list of source journals obtained from the two major sampling frames (i.e. CLOSSS and list of cited titles from pilot study). This list of titles compiled from judgements of librarians was checked against the pilot study list of cited titles and the following number of titles, broken down by subject, were found to be in common:

TABLE 7

NUMBER OF JOURNALS, BY SUBJECT CLASSIFICATION, COMMON TO LIST OF CITED JOURNALS IN PILOT STUDY AND LIST OF JOURNALS JUDGED IMPORTANT

Subject	No. of titles
Geography	1
Education	3
Politics/International Relations	1
Public Administration	2
Planning	0
General	1
Psychoanalysis	0
Social Work	1

However, it was decided to include as sources for the main study only the first 50 most frequently cited journals in pilot study. This meant that none of the journals listed in Appendix 13 in the fields of geography, politics/international relations, public administration, planning, psychoanalysis and

and social work would be included in a list of source journals drawn from the list of the 50 most frequently cited titles in the pilot study. One title in education and two classified as general social science in Appendix 13 were in the list of 50 cited titles. Therefore, titles in most of these fields were added to the sample of source journals for the main study. The titles included are given in Appendix 14. In the case of most subject headings in Appendix 13, five titles were taken at random, with the exception of history and planning. The titles selected are listed in Appendix 14. It was considered that the fields of politics/international relations, economics, psychology (including social psychology, child psychology, psychiatry, and occupational psychology), sociology, and general social science were already covered adequately by the two major sampling frames. It is planned to include in the citation file some of the citation data gathered by the Organisation of Information for Planning project being carried out by Brenda White at Edinburgh University, and a separate study of the relationship between history and social science is planned as a joint exercise between DISISS and a library school.

From the three sampling frames - CLOSSS, cited titles in pilot study, and key journals identified by librarians - a very wide range of social science journal titles was compiled.

3.4 Citation Record 72

The citation data collection sheet (reproduced in Appendix 1a) used for the pilot study was modified considerably for the main citation study in 1972. Data collection was streamlined by reducing the number of data fields, ensuring that the data was largely self-coding, and printing it on 5" x 8" cards to make for easier handling and storage.

The requirements of two of the major analyses to be performed on the data - clustering and descriptive accounts of the literature - pulled in different ways in coming to a decision about the number of data fields to be included in the Citation Record 72. From the point of view of clustering, a large number of citations, of the order of 70,000, is required with the minimum amount of detail necessary to show the relationship between one title and another. From the point

of view of descriptive studies, details about the form of the cited document, year of publication, number of pages, etc. are required. In the event, a compromise was reached and the 15 data fields included in the pilot study were reduced to 9 for the main study. The record card used for the main study is reproduced in Appendix 1b.

It was decided that the citations collected on the "long" record format in 1971 (approximately 5,000) would be sufficient for some of the descriptive studies. Data fields included in the 1971 version, but excluded in the 1972 version, were: (i) field 2, full transcription of citation; (ii) field 3, form of citation; (iii) field 4, number of times citation occurred in source; (iv) field 6, number of authors of cited item; (v) field 8, form of content of cited item; (vi) field 10, language of cited item; and (vii) field 14, language of cited document.

In addition to a source code, the Citation Record 72 included the following data fields: (i) authors, up to a maximum of four, of source item; (ii) authors of cited item; (iii) title of cited document; (iv) form of cited document; and (v) year of publication, volume number and page number of citations.

3.5 Organization of data collection in London libraries

The data was collected by students of the Polytechnic of North London in London libraries, mainly the British Library of Political and Economic Science, and was organized by Miss Ritchie and Mr. Nicholas. Twenty-four students were employed during a period of three weeks in March and April 1972.

3.6 Results

A total of 27,450 citations was recorded from 74 source journals; most of the latter were issued in 1970, with one or two from 1969. Data collection was completed in the case of 55 journals, and a sample of citations was taken from 9 journals. There were no citations in the 1970 issues of 10 journals on the source list, 2 journals had ceased

publication in 1970, and one was judged to be outside the scope of DISISS. A full account of the number of citations taken from each source journal is given in Appendix 15.

Most of the source journals were in English, although a few were in foreign languages. The country of origin of the source journals is given in Table 8.

TABLE 8

CLASSIFICATION OF SOURCE JOURNALS BY COUNTRY OF ORIGIN

Country	No.
USA	32
UK	31
France	4
Germany	2
Spain	1
Canada	1
Nigeria	1
Egypt	1
Netherlands	1

The source list of journals contained a total of 130 titles (Appendix 15). Thirty-five of the titles were found to be included on the ISI tapes, and since sufficient citation data for these titles could be obtained from the ISI file, they were not included in the main data collection. Forty-two of the 130 journals listed in Appendix 15 were not inspected during the main collection. These titles were not on ISI tapes. Some of these titles, together with a further set of foreign language titles, are to be included in a further data collection in 1972 (see 3.8).

In order to plan for the final stage of data collection in the second half of 1972, a breakdown of citations by subject was undertaken to ensure that none of the major social sciences had been under-represented. The result is given in Table 9. At this stage all the major social sciences, with the exception of sociology, have been adequately covered by 6 or more source journals and over 2,000 citations gathered for each discipline. Sociology and also criminology are to be given preference in the final stages of data collection to ensure that these subjects are adequately covered.

TABLE 9

CITATIONS COLLECTED IN MAIN STUDY, BY SUBJECT CLASSIFICATION

Subject[1]	No. of source journals[2]	No. of citations
Economics	15[3]	6970
Education	9	1595
Linguistics	7	3045
Psychology, psychiatry and psychoanalysis	8	4110
Ergonomics	1	420
Politics and public admin.	9	1155
Management	6	1365
Sociology	4	2365
Criminology	1	370
Anthropology	2	1140
Social work	3	995
Statistics	2	1030
Librarianship and information science	2	450
Geography	5	2440
TOTALS:	74	27450

[1] Journals covering more than one field were included under one heading only

[2] Includes journals with no citations

[3] This figure is made up of 14 economics journals, and 1 economics and social studies journal

3.7 Analyses

A large number of analyses is planned of the citation data, including work on clustering journal titles. This work will be reported in future working papers. Some of the analyses depend upon the creation of a machine file of citations, and since this is necessarily a lengthy procedure it was decided to undertake some of the counting operation involved in producing, for example, a frequency list of cited titles, by hand. It has seemed desirable to begin analysis of the data and to report some of the findings as quickly as possible, especially in view of the speed at which developments

are taking place regarding social science information services and policies. One major development in the very near future will be the publication in 1973 by ISI of Social Science Citation Index (SSCI). An important decision facing ISI has been the coverage of social science journal titles in the SSCI. DISISS has had contact with ISI in this connection.

Some of the work now in progress includes: (a) calculation of ratio of cited serial to cited monographs; (b) compilation of list of cited journals; (c) compilation of list of cited authors; (d) preliminary work on citation data for use in clustering; and (e) creation of a machine file of citations.

3.8 Completion of data collection

When the citation data gathered at Easter 1972, together with the citations gathered in the pilot study and those taken from ISI files, have been collated, a total of approximately 52,000 citations will exist in the file. About two-fifths of these citations will be to monographs.

It is planned to collect citations from about another 36 journal titles: 21 journals on the list given in Appendix 15 were not included in the Easter 1972 data collection and 15 are taken from a list of foreign language titles given in Appendix 16, judged by a social science librarian to be important and frequently used. The 1970 issues will be used.

When data collection is completed, a file of approximately 70,000 citations from about 135 source journals will be available.

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APPENDICES

DISISS - CITATION DATA COLLECTION SHEET (Pilot study)

(1) SOURCE IDENTIFICATION CODE

LEAVE BLANK

(2) FULL TRANSCRIPTION OF CITATION (Include connective phrasing where explanatory)

(3) FORM OF OCCURRENCE OF CITATION

LEAVE BLANK

Footnote ☐ Text ☐
List ☐ Other (specify)

(4) TIMES (2) OCCURS IN SOURCE

AUTHORS

(5) AUTHOR(S)/PERSON/S)/BODY RESPONSIBLE FOR ITEM CONTENT

(6) NUMBER OF AUTHORS

ITEM

(7) TITLE OF CITED ITEM (e.g. article/chapter/book, etc.)

(8) FORM OF CONTENT OF CITED ITEM (7)

Article ☐	Statistics ☐	Conf. Proc. ☐
Bibliography ☐	Abstract ☐	Primary material ☐
Chapter ☐	Index ☐	Review article ☐
Monograph ☐	Newspaper ☐	Law report ☐
Report ☐	Book review ☐	Other (specify)

(9) SUBJECT OF (7) (Assessment; from list in manual)

(10) LANGUAGE OF (7)

DOCUMENT

(11) TITLE OF CITED DOCUMENT (e.g. of journal/monograph; may be the same as cited item)

(12) FORM OF CITED DOCUMENT/MEDIA

Periodical journal	☐	Conference Proc.	☐
Monograph/Non-serial publ.	☐	Legal/legislation	☐
Report (serial)	☐	Cases/case notes	☐
Thesis	☐	MSS/Archives	☐
Bibliography	☐	Unpublished	☐
Statistics	☐	Personal contact	☐
Index to Resch./Theses	☐	Patent	☐
Year Book	☐		
Fixed period report	☐	Printout	☐
Abstract/Index	☐	Cartographic	☐
Contents/Accessions list	☐	Data bank	☐
Book review	☐	Audio Visual	☐
Newspaper	☐	Opinion Poll	☐

(13) DATE (Year)

(14) LANGUAGE OF DOCUMENT

COUNTRY (If identifiable)

(15) SUBJECT FIELD (Assessment; from list in manual)

ADDITIONAL

DATA COLLECTOR

APPENDIX 1b

Citation Record 72

DISISS CITATION RECORD 72

1 Record number	2 Source code	Year	Volume	First page no.

Authors of source item

3	3
3	3

Authors of cited item

4	4
4	4

Title of cited document

5

Form of cited document

6

Journal	A	Report	C	Conference Proc.	E	Government Pub.	G
Monograph	B	Newspaper	D	Legal & Legislation	F	Unpublished	H
						Other	J

7 Year of pub. of cited doc.	8 Vol. no. of cited doc. (if any)	9 Page numbers of cited items
		-

Code

Type of citation	Code
Citation taken from journal	Green card
Citation taken from monograph	Orange card
Citation to journal	Corner "off"
Citation to monograph	Corner "on"

APPENDIX 2

Summary of weighting values obtained for social science serials

The following notes describe the calculation of weighting values and serve to assist in the interpretation of the data presented in the table.

Subject classification

The classification has been derived from Dewey/UDC and is akin to the scheme used by Woodworth (1970) for the social sciences. The classification in WLOSSP and Ulrich has been made broadly compatible with Dewey/UDC. For convenience, 21 subject headings, based on the general schemes above, have been used in this exercise.

Serial populations

(i) Woodworth (1970). Lists current British serials/journals in classified order. N = 872 social sciences titles.

(ii) WLOSSP (1966). N = 1321 social sciences titles. The 142 subject indexing terms in WLOSSP were allocated between the 21 subject headings. The subject distribution of references to journal titles in the subject index was calculated. On average each journal title is referred to under two subject terms and in all, 2598 references to journals are made in the subject index, this being approximately twice the number of unique journal titles recorded. In making a subject distribution of 1321 journal titles the average distribution of references to journals from the subject index is assumed. The distribution derived by this method is crude but adequate.

(iii) Ulrich (1970). Current serials in a classified listing with world-wide coverage. N = 10923 social science titles.

(iv) CLOSSS. 100 titles selected at random from CLOSSS data base.

Method of calculating proportions of classes (columns 1-5)

This calculation produces the weighting of titles in each subject:

$$\frac{\text{No. of titles in each subject class}}{\text{N social sciences titles}} \times 100$$

Applying this formula to the serial populations gives the values in columns 1, 2 and 3; these values are used in calculating the values in columns columns 4 and 5. The values (columns 1 to 4) were originally calculated to 3 places of decimals, but are given here as whole numbers, by rounding up and moving the decimal one place to the right.

e.g. 0.915 = 9; 5.538 = 55, etc.

Columns 6 and 7 contain values based on a random sample of titles from CLOSSS.

Weights for sampling (columns 8-12)

The values given, based on data in columns 1-4, provide possible distributions of serial titles across subject classes. Data on serials in philosophy, history, area studies and "general" serials was not used in calculation of sampling weights, mainly because it would have created further bias.

Columns 8, 9 and 10 give distribution values for samples of various size (sample size depending on the proportion of titles which remain in the particular serial population after excluding titles in the classes mentioned above). In column 11 a mean is calculated from values in columns 8, 9 and 10; the mean values are expressed as a ratio equivalent to a percentage; in column 12 the same procedure is repeated on the random sample from CLOSSS.

Interpretation

The values derived are very crude. It is not possible to make any absolute direct comparisons owing to the varied nature of the original sampling frames. At best, inspection of the values gives a relative idea of subject scattering, perhaps best summarized in the arithmetic mean in column 4 and in the mean sampling weights (column 11) and CLOSSS derived sampling weight (column 12).

Weighting values

Subject	Column 1	2	3	4	5	6	7	8	9	10	11	12
	Woodworth[1]	WLOSSP[2]	Ulrich[3]	$\bar{n}$ cols. 1, 2 and 3	Values in col. 4 as ratio of 1	CLOSSS[4,5]	Values in col. 6 as ratio of 1	Woodworth[1] For sample, n = 75	WLOSSP[2] For sample, n = 74	Ulrich[3] For sample, n = 94	$\bar{n}$ cols. 1, 2 and 3. For sample, n = 101	CLOSSS[4] For sample n = 100
Philosophy	13	13	20	15	-	1	-	-	-	-	-	-
"General" (incl. Phys.Sci.)	144	2	0	48	-	0	-	-	-	-	-	-
Psychology	16	4	34	18	.022	8	.085	2	5	4	2	10
Social Sciences General	2	34	11	16	.019	5	.053	1	4	1	2	6
Sociology	10	86	24	40	.049	6	.063	1	10	3	5	7
Statistics/Demography	15	48	24	29	.035	4	.042	2	5	3	4	5
Politics	39	129	112	93	.115	5	.053	5	14	12	11	6
Economics	83	237	130	147	.181	13	.138	10	26	14	19	16
Law	48	92	61	67	-	1	.010	-	-	-	-	-
Public Administration	39	20	31	30	.037	4	.042	5	2	3	4	5
Social Welfare	86	62	55	68	.084	4	.042	10	7	6	8	5
Education	122	13	124	86	.106	7	.075	14	1	14	11	8
Commerce	122	10	30	54	.066	3	.032	14	1	3	7	4
Language	11	18	28	19	.023	12	.127	1	2	3	2	14
Anthropology, Archeology and Customs/Folklore	47	90	26	54	.066	1	.010	6	10	3	7	1
Business Management	192	44	151	129	.159	4	.042	2	5	17	6	5
Environment	16	7	51	25	.000	2	.000	1	1	6	-	2
Geography	8	6	14	25	.030	5	.053	1	1	2	3	6
Criminology	0	5	9	-	-	1	.010	-	-	-	-	-
History	0	27	55	-	-	4	.042	-	-	-	-	-
Area Studies	0	62	9	-	-	4	.042	-	-	-	-	-

TABLE KEY

(i) Sources of data

1 Woodworth, D. Guide to current British journals, London, Library Association, 1970.

2 WLOSSP: World list of social science periodicals, Paris; UNESCO, 1966.

3 Ulrich's international periodicals directory, New York, Bowker, 1970.

4 CLOSSS: Check List of Social Science Serials.

5 Four library science titles drawn in sample not included.

(ii) Column values

Column	Source	Units
1	Woodworth	Percentage ratios converted to whole numbers
2	WLOSSP	Percentage ratios converted to whole numbers
3	Ulrich	Percentage ratios converted to whole numbers
4	Mean ($\bar{n}$) of cols. 1, 2 and 3	Percentage ratios converted to whole numbers
5	Mean ($\bar{n}$) of cols. 1, 2 and 3	Values from col. 4 expressed as ratio of 1
6	CLOSSS	Distribution of titles from CLOSSS (n = 98)
7	CLOSSS	Values (from col. 6) expressed as ratio of 1
8	Woodworth	Distribution values for drawing a sample of 75 titles, based on ratios in col. 1
9	WLOSSP	Distribution values for drawing a sample of 94 titles, based on ratios in col. 2
10	Ulrich	Distribution values for drawing a sample of 94 titles, based on ratios in col. 3
11	Mean ($\bar{n}$) of cols. 1, 2 and 3	Distribution values for drawing a sample of 101 titles, based on ratios in col. 4
12	CLOSSS	Distribution values for drawing a sample of 100 titles, based on ratios in col. 6

APPENDIX 3

Core Journals identified by social science librarians (arranged by libraries contacted).

1. British Library of Political and Economic Science

American economic review
Current sociology
Economica
Environment and planning
Lloyds bank review
New Society
Review of economics and statistics
Urban studies

2. British Institute of Management

Harvard Business Review
Personnel management
Financial Times
Management today
Industrial management
The Director
Management decision
Business administration

3. Department of the Environment

Municipal journal
Local government chronicle
Town and country planning
New Society
Journal of the Royal Town Planning Institute
Local government finance
Municipal review
Rural district review
Economist
Economic trends
Department of Employment and Productivity Gazette
Trade and Industry

4. Department of Trade and Industry

Business economics
Oxford economic papers
Journal of world trade law
Journal of international economics
Western economic journal
Quarterly journal of economics

5. Royal Geographical Society

Geographical journal
Transactions of the Institute of British Geographers
Scottish geographical magazine
Geography
Economic geography
Geographical review
Tijdschrift voor economische en sociale geografie
Geografiska annaler

6. Royal Institute of International Affairs

American journal of international law
Foreign affairs
International affairs
International journal
International organisation
Orbis
World today
Economist
Far eastern economic review
West Africa
U.S. News and world report

7. Royal Institute of Public Administration

Public administration
Political quarterly
Parliamentary affairs
Public administration review
Political studies
Planning
PAC Bulletin
O & M Bulletin

8. Royal Town Planning Institute

Journal of the American Institute of Planners
Journal of the Royal Town Planning Institute
Town and country planning
Regional studies
Urban studies
Town planning review
Journal of planning and property law
Environment and planning

9. Tavistock Institute of Human Relations

Psychology

Behavioral Science
Brit. J. Psychology
Genetic Psychology Monogr.
J. Abnormal Psychology
J. General Psychology
J. Genetic Psychology
J. Personality
J. Personality and Soc. Psychology
J. Psychology

Social Psychology

Brit. J. Soc. & Clin. Psychology
J. Social Issues
J. Social Psychology
Sociometry

Child Psychology and Psychiatry

Child Development
Developmental Psychology
J. Amer. Acad. Child Psychiatry
J. Child Psychology and Psychiatry
Merrill-Palmer Quart.

Psychiatry

Amer. J. Orthopsychiatry
Amer. J. Psychiatry
Amer. J. Psychotherapy
Arch. General Psychiatry
Brit. J. Medical Psychology
Brit. J. Psychiatry
J. Nervous and Mental Disease
Psychiatric Quart.
Psychiatry

Psychoanalysis

Int. J. Psychoanalysis
J. Amer. Psychoanalysis Assoc.
Psychoanalytic Quart.

Occupational Psychology

Admin. Science Quart.
J. Applied Behav. Science
J. Applied Psychology
Occupational Psychology
Personnel Psychology

Sociology

Amer. J. Sociology
Amer. Sociological Review
Brit. J. Sociology
Social Forces
Social Problems
Sociological Review
Sociology

Social Work

Brit. J. Social Work
Social Casework
Social Service Review
Social Work (NY)
Social Work Today

General

Family Process
Human Organisation
Human Development
Human Relations
Social Science and Medicine
Social Science Information

10. University of London. Institute of Advanced Legal Studies

American journal of international law
British tax review
British yearbook of international law
Cambridge law journal
International and comparative law quarterly
Journal of business law
Law quarterly review
Modern law review
New law journal
Public law
Solicitors journal

11. University of London. Institute of Historical Research

English historical review
Bulletin of the Institute of Historical Research
Economic history review
Past and Present
Historical journal
History
Journal of British Studies

12. University of London. Institute of Education

British journal of educational psychology
British journal of educational studies
British journal of educational technology
Child development
Educational review
Educational research
Harvard educational review
International review of education
Journal of curriculum studies
Trends in education

APPENDIX 4

Source journals used in pilot study and statistical summary of coverage

Journal Title and Subject	Year	No. citations gathered	No. articles inspected
SOCIOLOGY			
American J. of Sociology	1950	182	16
	1959	106	6*
	1968	91	7
American Sociological Review	1950	37	3*
Archives Européenes de Sociologie	1960	84	4
	1968	92	4*
British J of Sociology	1950	111	7
	1960	174	9
	1968	232	8
Sociological Review	1960	50	5*
	1969	132	6
ECONOMICS			
Economic Journal	1950	105	7
	1960	92	12
	1969	98	3*
Economica	1950	71	8
	1960	157	9
	1970	63	10
Revue Economique	1950	123	18
	1960	144	13
	1969	134	14
POLITICS			
American Political Science Review.	1950	100	7*
Australian J of Politics and History.	1960	265	16
	1969	77	1*
Parliamentary Affairs	1950	15	14
	1960	92	14
	1969	60	10

PSYCHOLOGY			
American Psychologist	1950	97	43
	1960	31	2*
British J of Psychology	1950	52	6
	1960	180	12
	1970	258	18
Psychologische Forschung	1950	180	4
	1959	241	4
ANTHROPOLOGY			
American Anthropologist	1950	88	8
	1960	400	25
	1969	16	1*
CRIMINOLOGY			
British J of Criminology	1960	115	17
	1969	158	12
SOCIAL SERVICES			
Social Service Quarterly	1950	60	17
	1960	104	15
	1970	50	8

* Data collection left incomplete.

APPENDIX 5

Notes on sampling of source journals

The problem is to generate a random sample of about 15,000 citations from the source material. The size of the sample is restricted by considerations of cost, but it cannot be known in advance of the study the exact number of sources that can be covered.

Probably the easiest way to do this is to generate a multi-stage sample, taking as the first stage a simple random sample of journals from within which, at the second stage, a cluster sample of citations is derived by taking all citations from articles chosen from the journals by systematic random sampling. The reason for this is that although it is easy to generate the first stage sample of journals before fieldwork begins, it is not possible, without further preliminary work after the first stage, to generate a sampling frame for non-systematic sampling at the second stage.

As set out above, the procedure is relatively simple. A simple random sample of (n) journals is generated from the source list; a decision is taken about the proportion $(\frac{1}{r})$ of articles to be sampled, and the fieldworker is given the journal identifications and asked to record all citations for the ith (where it is a random number between 1 and r) article and every rth article thereafter in each journal.

It is now necessary to find the values of (n) and (r) required to generate a sample of 15,000 citations: this involves an estimate of the average number of articles per journal and the average number of citations per article, and further, an indication of the accuracy of these estimates.

On the basis of citation data from 4 articles from each of 31 journals:

We can be 95% confident that

Average no. of articles/journal = 41.77 ± 6.76

Average no. of citations/article = 22.74 ± 4.26

We can be 75% confident that

Average no. of articles/journal = 41.77 ± 3.88

Average no. of citations/article = 22.74 ± 1.47

If N_c is number of citations generated, $\frac{n}{r}$ x average no. of articles/journal x av. no. of citations per article = N_c

i.e. We are approx. 90% confident that

$$\frac{n}{r} \times (41.77 \pm 6.76) \times (22.74 \pm 4.26) = N_c$$

rearranging: 90% confident that:

$$\frac{N_c}{1,310.31} \leqslant \frac{n}{r} \leqslant \frac{N_c}{647}$$

for $N_c = 15,000$

$$11.45 \leqslant \frac{n}{r} \leqslant 23.18$$

or 56% confident that

$$\frac{N_c}{1.105} \leqslant \frac{n}{r} \leqslant \frac{N_c}{806}$$

for $N_c = 15,000$

$$13.5 \leqslant \frac{n}{r} \leqslant 18.6$$

Since most variations appear to occur at the first stage (i.e. citations vary more between journals than within them) it would seem wise to cut possible error by taking n relatively large.

say $n > 50$

Taking $r = 4$

90% confident that $45.8 \leq n \leq 92.72$

56% " " $54 \leq n \leq 74.4$

taking $r = 3$

90% confident that $34.35 \leq n \leq 69.5$

56% confident that $40.5 \leq n \leq 55.8$

Having chosen r we do not need a rigid choice of n since, by arranging our list of 144 journals in random order we can increase our number of first stage journals merely by taking the next journal on the list and every rth article in it until time and money run out.

APPENDIX 6a

Journals ranked by no. of times cited, excluding self-citations, from data collected summer 1971

No.	Journal title	No. of times cited	No. of self citations (where relevant)
1	American Sociological Review	68	2
2	Journal of Experimental Psychology	39	
3	Economic Journal	33	29
4	Zeitschrift für Angewandte Psychologie	31	
5	Psychological Review	30	
6	Review of Economic Studies	25	
7	Psychology Bulletin	24	
8	American Journal of Sociology	23	18
9	Journal of Abnormal & Social Psychology	23	
10	Journal of Political Economy	23	
11	American Journal of Psychology	22	
12	Social Forces	22	
13	Nature	20	
14	American Economic Review	19	
15	Quarterly Journal of Experimental Psychology	19	
16	Science	17	
17	Econometrica	15	
18	Journal of comparative & physiological psychology	15	
19	Economie Appliquée	14	
20	Economist	14	
21	Journal of Personality	14	
22	Economica	13	25
23	Journal of the Royal Statistical Society	13	
24	Africa	11	
25	Administrative Science Quarterly	11	
26	British Journal of Delinquency	11	
27	Journal of Verbal Learning & Verbal Behaviour	11	
28	British Journal of the Philosophy of Science	10	
29	Review of Economics & Statistics	10	
30	Public Opinion Quarterly	9	
31	Quarterly Journal of Economics	9	
32	American Journal of Orthopsychiatry	8	
33	Archiv für Psychologie	8	
34	Canadian Journal of Economics and Political Science	8	
35	Child Development	8	
36	Human Organisation	8	
37	Journal of consulting & clinical psychology	8	
38	Medical Economics	8	
39	Psychol. Arbeiten	8	
40	Psychonomic Science	8	
41	Revue d'Economie Politique	8	
42	American Antiquity	7	
43	International Journal of Social Psychiatry	7	

No.	Journal title	No. of times cited	No. of self citations (where relevant)
44	Journal of Genetic Psychology	7	
45	Journal of Neurophysiology	7	
46	Journal of Psychology	7	
47	Journal of Social Psychology	7	
48	Manchester School	7	
49	Psychiatry	7	
50	Psychological Monographs	7	
51	Zeitschrift für Experimentelle und Angewandte Psychologie	7	
52	American Anthropologist	6	61
53	American Journal of Psychiatry	6	
54	American Political Science Review	6	11
55	Journal of Mental Science	6	
56	Monthly Labour Review	6	
57	Sociometry	6	
58	Sovetskaia Etnografiia	6	
59	Acta Psychologica	5	
60	American Psychologist	5	18
61	British Journal of Sociology	5	14
62	Canadian Journal of Psychology	5	
63	Current notes	5	
64	Etudes et Conjunctures	5	
65	Historische Zeitschrift	5	
66	Journal of American Folklore	5	
67	Journal of Applied Psychology	5	
68	Journal of Medical Education	5	
69	Journal of Social Issues	5	
70	Journal of the American Medical Association	5	
71	Oceania	5	
72	Oxford Economic Papers	5	
73	Psychological Reports	5	
74	Sociological Review	5	4
75	World Politics	5	
76	Archives de Psychologie	4	
77	Archiv fur die Gesamte Psychologie	4	
78	Archives Européennes de Sociologie	4	
79	British Journal of Educational Psychology	4	
80	Bulletin of the British Psychological Society	4	
81	Cambridge Journal	4	
82	China Digest	4	
83	Genetic Psychology Monographs	4	
84	Human Relations	4	
85	Journal Acoust. Soc. Am.	4	
86	Journal of the American Statistical Association	4	
87	Journal of Comparative Psychology	4	
88	Journal of the Siam Society	4	
89	Pacific Sociological Review	4	
90	Philosophical Studies	4	
91	Population Studies	4	
92	Revue d'Economie Politique	4	

No.	Journal title	No. of times cited	No. of self citations (where relevant)
93	Revue Française de Science Politique	4	
94	Review of Religious Research	4	
95	Rorschachiana	4	
96	Social Problems	4	
97	Social Service Quarterly	4	4
98	Yale Law Journal	4	
99	American Behavioural Scientist	3	
100	Année Sociologique	3	
101	Archiv für Sozial Wissenschaft und Sozialpolitik	3	
102	Archiv für Psychiatrie und Nervenkrankheiten	3	
103	Australian & New Zealand Journal of Sociology	3	
104	Behaviour	3	
105	Birmingham Journal	3	
106	Brain	3	
107	Educ. Psychol. Measure	3	
108	Foreign Affairs	3	
109	Geographical Review	3	
110	Giornale Degli Economisti	3	
111	Industr. Psychotechn.	3	
112	Journal of Experimental Education	3	
113	Japanese Psychological Research	3	
114	Journal of Educational Psychology	3	
115	Journal of Educational Sociology	3	
116	Journal of Marketing	3	
117	Journal of Philosophy	3	
118	Lancet	3	
119	National Institute Economic Review	3	
120	Neue Psychol. Stud.	3	
121	New Society	3	
122	Occupational Psychology	3	
123	Perceptual & Motor Skills	3	
124	Philosophy of Science	3	
125	Praktische Psychologie	3	
126	Psychologische Forschung	3	15
127	Psychologische Rundschau	3	
128	Public Administration	3	
129	Revue Internationale du Travail	3	
130	Revue Politique et Parlementaire	3	
131	Rhodes-Livingstone Papers	3	
132	Scottish Journal of Political Economy	3	
133	Sociological Quarterly	3	
134	Studium Gen	3	
135	Transactions of the American Philosophical Society	3	
136	Vierteljahrschrift Wiss. Philos. U. Soz.	3	
137	Vierteljahrschrift Wiss. Philos.	3	
138	Zeitschrift für Pädagogik Psychol.	3	
139	Acta Physiologica Scandinavica	2	
140	Actualité Economique Financière	2	

No.	Journal title	No. of times cited	No. of self citations (where relevant)
141	Adult Education	2	
142	American Museum of Natural History Anthropological Papers	2	
143	Annales (Economies, Sociétés, Civilisations)	2	
144	Annals	2	
145	Annals of Mathematical Statistics	2	
146	Annals of the New York Academy of Sciences	2	
147	Analyse et Prévision	2	
148	Anthropological Papers	2	
149	Architectural Record	2	
150	Australian Outlook	2	
151	Australian Quarterly	2	
152	Betrieb	2	
153	Biometrics	2	
154	British Journal of Criminology	2	6
155	British Journal of Medical Psychology	2	
156	British Journal of Psychiatry	2	
157	British Journal of Psychology	2	40
158	British Journal of Psychology Monogr. Supplement	2	
159	Bulletin of the Oxford Institute of Statistics	2	
160	Bureau of American Ethnology Bulletin	2	
161	Cahiers Internationaux	2	
162	Cahiers Internationaux de Sociologie	2	
163	Canadian Journal of Corrections	2	
164	Character and Personality	2	
165	China Weekly Review	2	
166	Chinese Economic Journal	2	
167	Colliery Guardian	2	
168	Comparative Studies in Society and History	2	
169	Current Sociology	2	
170	Daedalus	2	
171	Economic Record	2	
172	Ekonomisk Tidsskrift	2	
173	Harpers Magazine	2	
174	Electroencephalography and Clinical Neurophysiology	2	
175	Encounter	2	
176	Erkenntnis	2	
177	Esprit	2	
178	Eugenics Quarterly	2	
179	Grapholog MH	2	
180	Harvard Educational Review	2	
181	Harvard Law Review	2	
182	Human Factors	2	
183	L'Humanité	2	
184	Industrial & Labour Relations Review	2	
185	International Journal of Comparative Sociology	2	
186	Journal for the Scientific Study of Religion	2	
187	Journal of Clinical Psychology	2	
188	Journal of Mathematical Psychology	2	
189	Journal of Negro Education	2	
190	Journal of Neurology, Neurosurgery and Psychiatry	2	

No.	Journal title	No. of times cited	No. of self citations (were relevant)
191	Journal of the Operations Research Society of America	2	
192	Journal of the Opt. Society of America	2	
193	Criterion	2	
194	Kyklos	2	
195	Language	2	
196	Les Temps Modernes	2	
197	Listener	2	
198	London & Cambridge Economic Bulletin	2	
199	Medical Journal of Australia	2	
200	Nation	2	
201	Opinion News	2	
202	Proceedings of the Aristotelian Soc.	2	
203	Psychologic Review	2	
204	Psychologia	2	
205	Psychoanal. Stud. Child	2	
206	Psychosomatic Medicine	2	
207	Public Administration Review	2	
208	Publications of the American Statistical Association	2	
209	Review	2	
210	Review of Economic Statistics	2	
211	Revue Internationale de Sociologie	2	
212	Scandinavian Journal of Psychology	2	
213	School & Society	2	
214	Schrift	2	
215	Sewanee Review	2	
216	Skand. Arch. Physiol.	2	
217	Social & Economic Studies	2	
218	Social Work	2	
219	Survey of Current Business	2	
220	Time	2	
221	Transports	2	
222	Zeitschrift für Menschenkunde	2	

After the ranked list of the 222 journals cited twice or more in the pilot study had been compiled, further editing of the list of journal titles was undertaken, in order to identify journals that had divided, ceased publication, changed title, etc. Also, work on the citations to non-journal material gathered in the pilot study showed that some citations had been wrongly classified as non-journal citations, and these were subsequently added to the ranked list of cited titles. The results are given on the following pages. These additions have made little difference to the rank order of cited titles, but they are reported, partly for accuracy, and partly because it was this list from which journals were taken for sources in the main citation study. Only the first 52 most frequently cited journals are given; the remaining part of the frequency list was not affected by the editorial work and the addition of titles.

Journals ranked by no. of time cited in pilot study (annended list, first 52 only)

Rank	Journal Title	No. times Cited	Comment
1	American Sociological Review	68	
2	J. Experimental Psychology	39	
3	Economic Journal	33	
4	Zeitschrift für (Angewandte) Psychologie	31	
5	Psychological Review	31	
6	Review of Economic Studies	25	
7	Psychological Bulletin	25	
8	American J. of Psychology	25	
9	J. of Abnormal (and Social) Psychology	24	Now 2 journals - see no. 30.
10	American J. of Sociology	23	
11	J. of Political Economy	23	
12	Social Forces	22	
	Nature	20	Not Social science
13	American Economic Review	19	
14	Q. J. of Experimental Psychology	19	
	Science	17	Not social science
15	J. of Comparative and Physiological Psychology	17	
16	Econometrica	15	
17	Economie Appliquée	14	
	Economist	14	Not a journal (?)
18	J. of Personality	14	
19	Economica	13	
20	J. of the Royal Statistical Society	13	Series A - general
21	British J. of Criminology	13	Includes Brit. J. of Delinquency
22	Africa	12	
23	Review of Economics and Statistics	12	
24	Revue d'Economie Politique	12	
25	Administrative Science Quarterly	11	
26	J. of Verbal Learning and Verbal Behaviour	11	
	British J. of the Philosophy of Science	10	Not social science
27	Q. J. of Economics	10	
28	Public Opinion Quarterly	9	
29	British J. of Psychiatry	9	Includes Journal of Mental Science
30	J. of Social Psychology	9	
	J. of the American Medical Association	9	Not social science
	Medical economics	9	Not social science
31	American J. of Orthopsychiatry	8	
32	Archiv für Psychologie	8	
33	Archives de Psychologie	8	
34	Canadian J. of Economics (and Political Science)	8	Now 2 journals
35	Child Development	8	
36	Human Organization	8	

37	J. of Consulting and Clinical Psychology	8	
38	J. of Genetic Psychology	8	
39	Psychologische Arbeiten	8	
40	Psychonomic Science	8	
41	American Antiquity	7	
42	American Political Science Review	7	
43	China Digest	7	
44	Canadian J. of Psychology	7	
45	American Psychologist	7	
46	International J. of Social Psychiatry	7	
	J. of Neurophysiology	7	Not social science
47	J. of Psychology	7	
48	Manchester School of Economic and Social Studies	7	
49	Monthly Labor Review	7	
50	Psychiatry	7	
	Psychological Monographs	7	Now supplement to American Psychologist
51	Zeitschrift für Experimentelle und Angewandte Psychologie	7	
52	American Anthropologist	6	

APPENDIX 6b

Pilot Study: Summary of Results

Source	Total citations gathered	Citations /article	Self citations	Self Citations as percentage of total citations	Number of times cited by other source journals
American Anthropologist	504	15	61	12	6
American J. of Sociology	379	9	18	5	23
American Political Science Review	100	14	11	11	6
American Psychologist	128	3	18	14	5
American Sociological Review	37	12	2	5	68
Archives Européenes de Sociologie	176	22	-	-	4
Australian J. of Politics and History	342	20	7	2	-
British J. of Criminology	273	9	6	2	2
British J. of Psychology	490	13	40	8	2
British J. of Sociology	517	21	14	3	5
Economica	291	10	25	8	13
Economic Journal	295	13	29	10	33
Parliamentary Affairs	167	4	3	2	-
Psychologische Forschung	421	52	15	3	3
Revue Economique	401	9	19	4	-
Social Service Quarterly	214	5	4	2	2
Sociological Review	182	16	4	2	5
TOTALS	4918	406	276		176

Total number of journals cited	619
Number of journals cited once only	397
Total number of citations to journals	1,946
Average number of citations per article	12

APPENDIX 7

Alphabetical list of cited journals (pilot study)

Title	No. of times cited	Self citations (for source jnls only).
The Accountant	1	
Acta Geographica	1	
Acta Physiologica Scandinavica	2	
Acta Psychologica	5	
Acta Soc. sci. fenn.	1	
Actualité Economique & Financière	2	
Adatrechtbundels	1	
Administrative Science Quarterly	11	
Adult Education	2	
Advances in child health and behaviour	1	
Advocate	1	
American historical review	1	
Aerospace medicine	1	
America Indigena	1	
American J. of Optom.	1	
Africa	12	
Afroamerica	1	
American anthropologist	6	62
American Ann. deaf	1	
American Antiquity	7	
American Behavioral Scientist	3	
American conference on admissions, counsellors' journal	1	
American economic association papers and proceedings	1	
American Economic Review	19	
American J. of Orthopsychiatry	8	
American Journal of physical anthropology	1	
American J. of Psychiatry	6	
American J. of Psychology	25	
American J. of Sociology	23	19
American Magazine	1	
American Mercury	1	
American Museum journal	1	
American Museum of Natural History Anthropological papers	2	
American Political Science Review	7	11
American Psychologist	7	19
American Scientist	1	
American Sociological Review	10	
Ammunition	1	
Analyse et Prevision	2	
Ann. d. Philos. (1926)	1	
Annales de géographie	1	

Annales de l'Université de Paris	1	
Annales des Mines	1	
Annales (Economies, Sociétés, Civilisations)	2	
Annali di economica	1	
Annals	2	
Annals of Mathematical Statistics	2	
Annals of the American academy of political and social science	2	
Annals of the Hitotsubashi academy	1	
Annals of the New York Academy of Sciences	2	
L'Annam nouveau (Hanoi)	1	
Année Sociologique	3	
Annual review of psychology	1	
Anthropologica	1	
Anthropological Papers	2	
The Antiseptic (Madras)	1	
Architectural forum	1	
Architectural Record	2	
Arch. of. philos.	1	
Arch. gen. psychiatry	1	
Arch. physiol.	1	
Archiv für die Gesamte Psychologie	4	
Archiv für Psychiatrie und Nervenkrankheiten	3	
Archiv für Psychologie	8	
Archiv für Sozial Wissenschaft und Sozialpolitik	3	
Archives de philosophie du droit,et de sociologie juridique	1	
Archives de Psychologie	6	
Archives Européennes de Sociologie	4	
Archivo scientifico	1	
Arts et Manufactures	1	
Australian & New Zealand J. of Sociology	3	
Australian J. of Education	1	
Australian Journal of Politics and History	0	7
Australian Outlook	2	
Australian P.S.A. News	1	
Australian Quarterly	2	
B.A.C.H. Newsletter	1	
B.B. Gazette (scouts. 1906)	1	
Bantu studies	1	
The Bazaar, or literary & scientific repository (1823)	1	
Behaviour	3	
Ber. Deutsche Graph.	1	
Betrieb	2	
Bijdragen tot de taal-, land-, en volkenkunde	1	
Biometrics	2	
Biometrika	1	
Birmingham Journal	3	
Birmingham Monthly Argus	1	
Brain	3	
British J. of Addiction	1	
British Journal of Criminology	2	6

British Journal of Delinquency	11	
British Journal of Educational Psychology	4	
British Journal of Medical Psychology	3	
British J. of Psychiatric social work	1	
British Journal of Psychiatry	2	
British Jo urnal of Psychology	2	41
British Journal of Psychology Monogr. Supplement	2	
British Journal of Sociology	6	15
British Journal of the Philosophy of Science	10	
Brooklyn Law Review	1	
Bulletin de la société internationale de ctiminologie	1	
Bulletin of Narcotics	1	
Bulletin of the American Museum of natural history	1	
Bulletin of the British Psychological Society	4	
Bulletin of the Menninger clinic	1	
Bulletin of the N.Y. Academy of Medicine	1	
Bulletin of the Oxford Institute of Statistics	2	
Bulletin of the world health organisation	1	
Bureau of American Ethnology Bulletin	2	
Business Weekly	1	
Cahiers de la republique	1	
Cahiers du centre de recherches d'etudes des chefs d'enterprises	1	
Cahiers Internationaux	2	
Cahiers Internationaux de Sociologie	2	
Cambridge historical journal	1	
Cambridge journal	4	
Canadian Journal of Corrections	2	
Canadian historical review	2	
Canadian Journal of Economics and Political Science	8	
Canadian Journal of Psychology	7	
Caribbean Affairs	1	
Case conference	1	
Catholic World	1	
Character and Personality	2	
Child Development	8	
Child Welfare	1	
Child welfare league bulletin	1	
China critic	1	
China Digest	7	
China Weekly Review	2	
Chinese Economic Journal	2	
Chinese social and political science review	1	
Christian Century	1	
Cognitive psychology	1	
College and University	1	
Colliers	1	
Colliery Guardian	2	
The Colonial review	1	
Commentary	1	
Commerce News	1	
Common Ground	1	
Comparative Studies in Society and History	2	

Contemporary psychology	1	
Cortex	1	
Crime and correction, law and contemporary problems	1	
Crime and Delinquency	1	
Crisis	1	
Critique	1	
Current anthropology	1	
Current Notes	5	
Current Sociology	2	
Daedalus	2	
Demography	1	
Deutsche Literatur-Zeitung	1	
Deutsche Zeitschrift für die gesamte gerichtliche Medizin	2	
Diagnostica	1	
Digest Neurol. Psychiat.	1	
Diogenes	1	
Diplomate	1	
Discovery	1	
District Bank Review	1	
Dokl. Akad. Redag. Nauk. RSFSR	1	
Econometrica	15	
Economic development and cultural change	1	
Economic history review	1	
Economic Journal	33	29
Economic Record	2	
Economic Weekly (of Bombay)	2	
Economica	13	26
Economics trends	1	
Economie Appliquée	14	
Economie et humanisme	1	
Economist	14	
De Economist	1	
Edinburgh Review	1	
Educ. Psychol. Measure	3	
Educational record	1	
Educ. res.	1	
Educ. rev.	1	
Ekonomisk Tidsskrift	3	
Electroencephalography and Clinical Neurophysiology	2	
Elementary Schools J.	1	
Encounter	2	
Ergonomics	1	
Erkenntnis	2	
Esprit	2	
Ethics	1	
Etudes et Conjoncture	5	
Eugenics Quarterly	2	
Eugenics Review	1	
Europe	1	
Foreign Affairs	3	
Fortschr. psychol.	1	
Fortune	2	

Foundation (S.A.)	2
France - Asie	1
Garden cities and town planning	1
Genetic Psychology Monographs	4
Geographical Journal	1
Geographical Review	3
Geographical studies	1
Gestion	1
Giornale Degli Economisti	3
Graphology M.H.	2
Grazier's Review (Brisbane)	1
Harpers Magazine	2
Harvard Educational Review	2
Harvard Law Review	2
Historical Studies in Australia and New Zealand	1
Historische Zeitschrift	5
Hommes et Mondes	1
Hommes et techniques	1
Human Factors	2
Human Organisation	8
Human Relations	5
L'Humanité	2
Illustrated London News	1
Industr. Psychotechn.	3
Industrial & Labour Relations Review	2
Industrial Information Bulletin	1
Information Radicale-Socialiste	1
Information Retrieval	1
International Affairs	1
International Economic Review	1
International Journal of American Linguistics	1
International J. of Comparative Sociology	2
International J. of Opinion and Attitude Research	1
International J. of Psycho-analysis	1
International J. of Social Psychiatry	7
International Social Science Bulletin	1
Isis	1
Jahrbuch Charakterol.	1
Jana (Ceylon)	1
Japanese Psychological Research	3
Jewish J. Sociology	1
John Marshall Law Quarterly	1
Journal for the Scientific Study of Religion	2
J. of Abnormal & Social Psychology	24
J. of African Administration	1
Journal of American Folklore	5
Journal of Applied Psychology	5
J. of Aud. Res.	1
J. Child Psychol. Psychiat.	1
J. Clinical Psychology	2
J. Comp. Neurol.	1
J. of Comparative Psychology	4
J. of Comparative & Physiological Psychology	17
Journal of Consulting & Clinical Psychology	8

J. of Counselling psychology	1
J. of Criminal law and criminology (SI)	3
J. of Criminal law, criminology & police science	1
Journal of Educational Psychology	3
J. Educ. res.	1
J. of Educational Sociology	3
J. Exp. Child psychol.	1
Journal of Experimental Education	3
J. of Experimental Psychology	39
J. of Farm Economics	1
Journal of Genetic Psychology	8
J. of Higher Education	1
J. of Industrial Relations	1
J. of Librarianship	1
Journal of Marketing	3
J. of Mathematical Psychology	2
J. of Medical Education	5
Journal of Mental Science	7
Journal of Negro Education	2
J. Nerv. ment. dis.	2
J. of Neurology, Neurosurgery and Psychiatry	3
J. of Neurophysiology	7
J. of Peace Research	1
J. of Personality	14
Journal of Philosophy	3
Journal of Political Economy	23
Journal of Psychology	7
J. Psychol. norm. path.	1
J. of Public administration	1
Journal of Public Health	1
Journal of Social Psychology	9
Journal of Social Issues	5
J. Speech and Hearing Disorders	1
J. of verbal learning and verbal behaviour	11
J. of the Acoustical Society of America	4
Journal of the American Medical Association	9
J. of the American Museum of Natural History	1
J. of the American Statistical Association	4
Journal of the British Medical Association	1
J. of the Dental Association of S.A.	1
J. of the Engineer's Guild	1
J. of the History of ideas	1
J. of the Louisiana State Medical Society	1
Journal of the Operations Research Society of America	2
J. of the Opt. Society of America	2
J. of the Royal Anthrop. Institute	1
J. of the Royal Society of Arts	1
Journal of the Royal Statistical Society	13
Journal of the Siam Society	4
J. of the Society for ind. & applied maths.	1
Journal of the Washington Academy of Science	1
Kolner Z.für Soziologie und Sozialpsychologie	1
Koloniale Rundschau	1
Kriterion	2
Kroeber Anthropological Society Papers	1

Kyklos	2
Labor News Letter	1
Lancet	4
Land Economics	1
Language	2
Les Temps Modernes	2
Lignar Science J.	1
Listener	3
Lloyds Bank Review	1
London & Cambridge Economic Bulletin	2
L.Q.R.	1
Mademoiselle	1
Man	1
Manchester School	7
Med-Pädag. Mol. Sprachheilk.	1
Medical Economics	9
Medical Journal of Australia	2
The Medico-Legal Journal	1
Megamot	1
Mem. Amer. Anthropolog. Assoc.	1
Mental Hygiene	2
Metroeconomica	1
Middle American Research Records	1
Mind	1
Ministry of Labour Gazette	1
Mitteilungen	1
The Modern Hospital	1
Modern Law Review	1
The Monist	1
Monthly Labour Review	7
Museum Notes	1
Nation	2
National Bank's Economic Bulletins (Egypt)	1
National Institute Economic Review	4
The National Reformer	1
Nature	20
Nederlands Tijdschrift voor Geneeskunde	1
La Nef	1
Negro Digest	1
Neue Psychol. Stud.	3
Neuropsychologica	1
New England J. Medicine	1
New Left Review	1
New Society	3
New Scientist	1
New Statesman	2
New Yorker	1
North American Review	1
Nova	1
Oceania	5
Occupational Psychology	3
Opinion News	2
Oxford Economic Papers	5

Pacific Sociological Review	4	
Pädag. Post.	1	
Pädag. Woche	1	
Palaeontologia Sinica	1	
Papers of the Michigan Academy of Science, Arts & Letters	1	
Papers of the New World Archaeological Found.	1	
Pädagogisch-psychologische Arbeiten	1	
Papers of the Peabody Museum of American Archaeology and Ethnology	1	
Parliamentary Affairs	0	3
Ped. Sem. (1894)	1	
Pennsylvania Law Review	1	
Percept. Psychophys.	1	
Perceptual & Motor Skills	3	
Perspectives Socialistes	1	
Pflügers Arch. Ges. Psychologie	1	
Philosophical Quarterly	1	
Philosophy of Science	3	
Philosophical Studies	4	
Phylon	1	
Physiol. Rev.	1	
Physiol. Zool.	1	
Police and Prison Officers Magazine	1	
Political Quarterly	1	
Political Science Quarterly	2	
Political Studies	1	
Population	1	
Population Studies	4	
Pour L'ère Nouvelle	1	
P.O.Q. (U.S.?)	1	
Praktische Psychologie	3	
Probl. Fiziol. Opt.	1	
Proc. Am. Phil. Soc.	1	
Proceedings of the Aristotelian Soc.	2	
Progress: the magazine of UNILEVER	1	
Projets	1	
Psychiatry	7	
Psychoanal. Stud. Child.	2	
Psychol. Arbeiten	8	
Psychol. Beitr.	1	
Psychol. Issues	1	
Psychol. Z.	1	
Psychologia	2	
Psychological Bulletin	25	
Psychological Monographs	7	
Psychological Reports	5	
Psychological Review	31	
Psychological Studies	1	
Psychologie Rev.	2	
Psychologische Forschung	2	15
Psychologische Rundschau	3	
Psychometrika	1	

Psychonomic Science	8
Psychosomatic Medicine	2
Psychotechn. Z.	1
Public Administration	3
Public Administration Review	2
Public Opinion Quarterly	9
Publications of the American Statistical Association	2
Publications of the Philadelphia Anthropological Society	1
Quarterly J. of Experimental Psychology	19
Quarterly J. of Economics	10
Quarterly Review	1
Quarterly Review of Biology	1
Race Relations	1
Rationalist Annual	1
Reader's Digest	1
The Reporter	1
R.S.L.F. (French)	1
Religious Education (supplement)	1
Review	2
Review of Economics & Statistics	12
Review of Economic Studies	25
Review of Religious Research	4
Revista Columbiana de Antropologia	1
Revista Juridica Veracruzana	1
Revista Penal Y Penitenciaria	1
Revista de Psihologie	1
Revue de Defense Nationale	1
Revue d'Economie Contemporaine	1
Revue d'Economie Politique	12
Revue d'Histoire Economique et Sociale	2
Revue de Marché Commun	1
Revue de Metaphysique et de Morale	1
Revue de Science Criminelle et de Droit Pénal Comparé	1
Revue Economique	0
Revue Francaise de Science Politique	5
Revue Internationale de Sociologie	3
Revue Internationale du Travail	3
Revue Politique et Parlementaire	3
Rhodes-Livingstone Papers	3
Rorschachiana	4
Round Table	1
Rural Sociology	1
Samml. Psychiat. u. Neurol. Einzeldarstellangen	1
Saturday Review of Literature	1
Scandinavian J. of Psychology	2
School and Society	2
School Review	1
Schrift	2
Schweiz Arch. Neurol. Psychiat.	1
Schweiz z. Psychol. Anwend.	1
Schweizerische Zeitschrift für Strafrecht	1
Sci. Monthly	1
Science	17

19

Scottish Journal of Political Economy	3	
Sewanee Review	2	
Sibirskii Etnograficheskii Sbornik	1	
Skand. Arch. Physiol.	2	
Social and Economic Studies	2	
Social Casework	1	
Social Forces	22	
Social Problems	5	
Social Research	1	
Social Service Quarterly	4	4
Social Sciences (Fukien)	1	
Social Work	2	
Socialist Commentary	1	
Sociological Quarterly	3	
Sociological Review	5	4
Sociologos	1	
Sociology	1	
S.O.U. (?)	1	
Sociology and Social Research	2	
Sociometry	6	
South African Archaeological Bulletin	1	
South African Journal of Economics	1	
South African Journal of Science	1	
Southern Economic Journal	1	
Southwestern Journal of Anthropology	1	
Sovetskaja Etnografiia	6	
Soviet Review	1	
Soviet Sociology	1	
Sredneaziatskii Etnograficheskii Sbornik	1	
Sredneaziatskii Sbornik	1	
Statistical Journal	1	
Stud. Educ.	1	
Studium Gen.	3	
Survey of China Mainland Press	1	
Survey of Current Business	2	
Le Temps	1	
Three Banks Review	1	
Tilapia Macrocephala Zoologica	1	
Time	4	
Transactions of the American Neurological Association	1	
Transactions of the American Philosophical Society	3	
Transports	2	
Trend of Economics	1	
Triton	1	
Twentieth Century	1	
Ugeskr. Laeg.	1	
Universities and Left Review	1	
Verh. Ges. Heilpädag.	1	
Vierteljahrschrift Wiss. Philos.	3	
Vierteljahrschrift Wiss. Philos. u. Soz.	3	
Visible Rec.	1	
Vital Speeches	1	
Vop. Psikhol.	1	

Western Political Quarterly	1
Wien z. Philosoph., Psychol. u. Pädagogik	1
Wilhelm Roux' Arch. Enwickl. - Mach. Org.	1
World Politics	5
Yale Law Journal	4
Yale Review	1
Zeitschrift für Angewandte Psychologie	31
Z. Abstammgelehre	1
Z. Charakterol.	1
Z. Diagn. Psychol.	1
Z. Deutsche Psychologie Ges. 2	1
Z. Exper. Pädag.	1
Z. fur Experimentelle und Angewandte Psychologie	7
Z. Ges. Staatswiss.	1
Z. Kinderforshq,	1
Z. Kinderpsychiat.	1
Z. Menschl. Vererb. u. Konstit. Lehre	1
Z. für Menschenkunde	2
Z. Psychother. Med. Psychol.	1
Zeitschrift für Pädagogik Psychol.	3
Z. Sinnesphysiol.	1

APPENDIX 7 (Continued)

Journals cited once only in pilot study

The Accountant
Acta geographica
Acta Soc. sci. fenn.
Adatrechtbundels
Advances in child health and behaviour
Advocate
Aerospace medicine
Afroamerica
American Ann. deaf
Am. conference on admissions, counsellors' journal
American economic association papers and proceedings
American historical review
America Indigena
Am. J. Optom.
American Journal of physical anthropology
American magazine
American mercury
American museum journal
American scientist
Ammunition
Annals of the American Academy of political science
Annales de géographie
Annali di economica
Annals of the American academy of political and social science
Annales des Wines
Annales de l'Université de Paris
Annals of the Hitotsubashi academy
Ann. d. Philos. (1926)
L'Annam Nouveau (Hanoi)
Anthropologica
The Antiseptic (Madras)
Annual review of psychology
Architectural forum
Arb. inst. Lpz. Lehrerver (Pädag-Psychol)
Arch. f. philos.
Archives de philosophie du droit, et de sociologie juridique
Arch. physiol.
Arch. gen. psychiatry
Archivo scientifico
Arts et manufactures
Australian J. of Education
Australian P.S.A. News
B.A.C.H. Newsletter
Bantu Studies
The Bazaar, or literary & scientific repository (1823)
Ber. Deutsche Graph.
Bijdragen tot de taal-, land-, en volkenkunde

Biometrika
Birmingham monthly argus
The B.B. Gazette (scouts1906)
British J. of Addiction
British J. Psych. social work
Brooklyn law review
Bull. Am. Mus. Nat. Hist.
Bulletin of the Menninger clinic
Bulletin of narcotics
Bulletin N.H. Acad. Med.
Bulletin de la societe internationale de criminologie
Bulletin of the world health organisation
Business weekly
Cahiers de la république
Cahiers dus centre de recherche d'études des chefs d'enterprises
Cambridge historical journal
Caribbean affairs
Case conference
Catholic World
Child welfare
Child welfare league bulletin
China critic
Chinese social and political science review
Christian century
Cognitive psychology
College and University
Colliers
The Colonial Review
Commentary
Commerce News
Common ground
Contemporary psychology
Cortex
Crime & correction, law and contemporary problems
Crime and delinquency
Crisis
Critique
Current anthropology
Dokl. Akad. Redag. Nauk. RSFSR
District bank review
Discovery
Diplomate
Digest Neurol. Psychiat.
Diagnostica
Diogenes
Deutsche Literatur - Zeitung
Deutsche Zeitschrift für die gesamte gerichtliche Medizin
Demography
Economic development & cultural change
Economic history review
Economic trends
Economic weekly (of Bombay)
Economie et humanisme
De Economist
Edinburgh Review

Educational record
Educ. res.
Educ. rev.
Elementary schools J.
Ergonomics
Ethics
Eugenics review
Europe
Fortschr. psychol.
France - Asie
Garden cities & town planning
Geographical journal
Geographical studies
Gestion
Grazier's review (Brisbane)
Historical studies - Australia & New Zealand
Hommes et Mondes
Hommes et techniques
Illustrated London News
Industrial Information Bulletin
Information radicale - socialiste
Information Retrieval
International Affairs
International Economic Review
International Journal of American Linguistics
International J. of Opinion and Attitude Research
Int. J. Psycho-analysis
International social science bulletin
ISIS
Jana (Ceylon)
Jb. Charakterol.
Jewish J. Sociology
John Marshall law quarterly
J. of African Administration
J. Amer. Mus. Nat. Hist.
J. Aud. Res.
J. Child psychol. psychiat.
J. comp. neurol.
J. of counselling psychology
J. Criminal law, criminology and police science
J. Educ. res.
J. Exp. child psychol.
J. of farm economics
J. of higher education
J. of industrial relations
J. of librarianship
J. nerv. ment. dis.
J. of Peace research
J. Psychol. norm. path.
J. of public administration
Journal of public health

J. Royal anthrop. institute
J. of society for ind. & applied maths.
J. Social psychology
J. Speech and hearing disorders
Journal of the British Medical Association
J. of the Dental Association of S.A.
J. of the Engineer's guild
J. of the History of ideas
J. of the Louisiana State Medical Society
J. of the Royal Society of Arts
Journal of the Washington academy of sciences
Kolner Z. für Soziologie und Sozialpsychologie
Koloniale Rundschau
Kroeber Anthropological Society Papers
Labor News Letter
Land Economics
Lignar Science J.
Lloyds Bank Review
L.Q.R.
Mademoiselle
Man
Med.-Pädag. Mbl. Sprach Heilk.
The Medico-Legal Journal
Megamot
Mem. Amer. Anthropolog. Assoc.
Metroeconomica
Middle American Research Records
Mind
Ministry of Labour Gazette
Mitteilungen
The Modern Hospital
Modern Law Review
The Monist
Museum Notes
National Bank's Economic Bulletins (Egypt)
The National Reformer
Nederlands Tijdschrift voor Geneeskunde
La Nef
Negro Digest
Neuropsychologia
New Left Review
New England J. Medicine
New Scientist
New Yorker
New Statesman
North American Review
Nova
Pädag. Post
Pädag. Woche
Palaeontologia Sinica
Papers of the Michigan Academy of Science, Arts & Letters
Papers of the New World Archaeological Foundation
Papers of the Peabody Museum of American Archaeology and Ethnology
Pennsylvania Law Review
Ped. Sem. (1894)
Percept, Psychophys.

Perspectives Socialistes
Perspectives Sociales
Pflügers Arch. Ges. Psychologie
Philosophical Quarterly
Phylon
Physiol. Rev.
Physiol. Zool.
Police and Prison Officers Magazine
Political Quarterly
Political Studies
Population
Pour L'ère Nouvelle
P.O.Q. (U.S.?)
Probl. Fiziol. Opt.
Proc. Am. Phil. Soc.
Progress: The magazine of UNILEVER
Projets
Psychol. Beitr.
Psychol. Issues
Psychological Studies
Psychometrika
Psychol. Z.
Psychotechn. Z.
Publications of the Philadelphia Anthropological Society
Quarterly Review
Quarterly Review of Biology
Race Relations
Rationalist Annual
Readers Digest
The Reporter
R.S.L.F. (French)
Religious Education (supplement)
Revista Columbiana de Antropologia
Revista Juridica Veracruzana
Revista Penal Y Penitenciaria
Revista de Psihologie
Revue de Defense Nationale
Revue d'Economie Contemporaine
Revue de Marché Commun
Revue de Metaphysique et De Morale
Revue de Science Criminelle et de Droit Pénal Comparé
Round Table
Rural Sociology
Samml. Psychiat. u. Neurol. Einzeldarstellungen
Saturday Review of Literature
School Review
Schweiz Arch. Neurol. Psychiat.
Schweiz z. Psychol. anwend.
Schweizersche Zeitschrift für Strafrecht
Sci. Monthly
Science and Society
Sibirskii Etnograficheskii Sbornik
Social Casework
Social Research

Social Sciences (Fukien)
Socialist Commentary
Sociologos
Sociology
S.O.U. (?)
South African Archaeological Bulletin
South African Journal of Economics
South African Journal of Science
Southern Economic Journal
Southwestern Journal of Anthropology
Soviet Review
Soviet Sociology
Sredneaziatskii Etnograficheskii Sbornik
Sreneaziatskii Sbornik
Statistical Journal
Stud. Educ.
Survey of China Mainland Press
Le Temps
Three Banks Review
Tilapia Macrocephala Zoologica
Transactions of the American Neurological Association
Trend of Economics
Triton
Twentieth Century
Ugeskr. Laeg.
Universities and Left Review
Verh. Ges. Heilpädag.
Vision Res.
Vital Statistics
Vop. Psikhol.
Western Political Quarterly
Wien Z. Philosoph., Psychol. u. Pädagogik
Wilhelm Roux Arch. Enwickl. - Mech. Org.
Yale Review
Z. Abstammgelehre
Z. Charakterol.
Z. Diagn. Psychol.
Z. Deutche Psychologie Ges. 2
Z. Exper. Padag.
Z. Ges. Staatswiss.
Z. Kingerforshq.
Z. Kinderpsychiat.
Z. Menschl. Vererb. u. Konstit. Lehre
Z. Psychother. Med. Psychol.
Z. Sinnesphysiol.
Z. Volker-Psychogie u. Soziol.

APPENDIX 8

Journals ranked by no. of times cited,
including self-citations, from data collected summer 1971.
(First 51 journals only).

No.	Journal title	No. of times cited
1	American Sociological Review	70
2	American Anthropologist	67
3	Economic Journal	62
4	British Journal of Psychology	42
5	American Journal of Sociology	41
6	Journal of Experimental Psychology	39
7	Economica	38
8	Zeitschrift für Angewandte Psychologie	31
9	Psychological Review	30
10	Review of Economic Studies	25
11	Psychology Bulletin	24
12	American Psychologist	23
13	Journal of Abnormal & Social Psychology	23
14	Journal of Political Economy	23
15	American Journal of Psychology	22
16	Social Forces	22
17	Nature	20
18	American Economic Review	19
19	British Journal of Sociology	19
20	Quarterly Journal of Experimental Psychology	19
21	Revue Economique	19
22	Psychologische Forschung	18
23	American Political Science Review	17
24	Science	17
25	Econometrica	15
26	Journal of Comparative & Physiological Psychology	15
27	Economie Appliquée	14
28	Economist	14
29	Journal of Personality	14
30	Journal of the Royal Statistical Society	13
31	Africa	11
32	Administrative Science Quarterly	11
33	British Journal of Delinquency	11
34	Journal of Verbal Learning & Verbal Behaviour	11
35	British Journal of the Philosophy of Science	10
36	Review of Economics & Statistics	10
37	Public Opinion Quarterly	9
38	Quarterly Journal of Economics	9
39	Sociological Review	9
40	American Journal of Orthopsychiatry	8
41	Archiv für Psychologie	8
42	British Journal of Criminology	8
43	Canadian Journal of Economics and Political Science	8
44	Child Development	8

No.	Journal title	No. of times cited
45	Human Organisation	8
46	Journal of Consulting and Clinical Psychology	8
47	Medical Economics	8
48	Psychol. Arbeiten	8
49	Psychomonic Science	8
50	Revue d'Economie Politique	8
51	Social Service Quarterly	8

APPENDIX 9

DIVISION OF SOURCE JOURNALS INTO TWO GROUPS

(a) Source journals

GROUP A

American Anthropologist	Anth.
American Psychologist	Psych.
Australian Journal of Politics and History	Pol.
British Journal of Sociology	Sociol.
Economica	Econ.
Parliamentary Affairs	Pol.
Revue Economique	Econ.
Sociological Review	Sociol.

GROUP B

American Journal of Sociology	Sociol.
American Sociological Review	Sociol.
Archives Européenes de Sociologie	Sociol.
British Journal of Criminology	Psych.
British Journal of Psychology	Psych.
Economic Journal	Econ.
Psychologische Forschung	Psych.
Social Service Quarterly	Social Work

American Political Science Review which was included in the list of 17 source journals for the pilot study was excluded from this calculation in order to make Groups A and B equal in size.

(b) Journals ranked by frequency of citation

Title	Rank Group A	Rank Group B
American Sociological Review	1	3
Economic Journal	2	-
Social Forces	3	76
American Journal of Sociology	4	40
Economie Appliquée	5	-
Journal of Political Economy	5	16
Revue d'Economie Politique	7	-
Science	7	28
Administrative Science Quarterly	9	-
Africa	9	76
American Economic Review	11	15
British Journal of the Philosophy of Science	11	-
Human Organisation	11	-
American Anthropologist	14	-
American Political Science Review	14	-
Economica	14	17
Journal of the Royal Statistical Society	14	28
American Antiquity	14	-
Econometrica	14	17
Journal of Abnormal and Social Psychology	20	9
Review of Economics and Statistics	20	50
Public Opinion Quarterly	20	50
Monthly Labour Review	20	123
Review of Economic Studies	24	6
American Journal of Orthopsychiatry	24	50
International Journal of Social Psychiatry	24	76
Sovetskaia Etnografiia	24	-
Current Notes	24	-
Etudes et Conjoncture	24	-
Journal of American Folklore	24	-
Oxford Economic Papers	24	-
Sociological Review	24	-
Revue Française de Science Politique	24	-
Nature	34	10
Psychiatry	34	50
Sociometry	34	75
Cambridge Journal	34	-
Journal of the Siam Society	34	-
Pacific Sociological Review	34	-
Population Studies	34	-
Review of Religious Research	34	-
Social Problems	34	123
Psychology Bulletin	43	6

Title	Rank Group A	Rank Group B
Journal of Consulting and Clinical Psychology	43	33
American Journal of Psychiatry	43	50
American Psychologist	43	32
Journal of Applied Psychology	43	76
Journal of Social Issues	43	76
World Politics	43	76
Human Relations	43	76
Behaviour	43	-
Birmingham Journal	43	-
Foreign Affairs	43	-
Giornale degli Economisti	43	-
Journal of Marketing	43	-
Journal of Philosophy	43	-
New Society	43	-
Philosophy of Science	43	-
Public Administration	43	-
Revue Internationale du Travail	43	-
Revue Politique et Parlementaire	43	-
Rhodes-Livingstone Papers	43	-
Transactions of the American Philosophical Society	43	-
American Museum of Natural History Anthropological Papers	43	-
British Journal of Psychology	43	123
Journal of Comparative and Physiological Psychology	66	11
Canadian Journal of Economics and Political Science	66	33
Journal of Psychology	66	33
Journal of Social Psychology	66	24
Manchester School	66	50
British Journal of Sociology	66	50
Archives Européenes de Sociologie	66	76
Journal of Comparative Psychology	66	76
American Behavioural Scientist	66	123
Archiv für Sozial Wissenschaft und Sozialpolitik	66	123
Journal of Educational Psychology	66	123
National Institute Economic Review	66	76
Sociological Quarterly	66	123
Actualité Economique Financière	66	-
Annales: Economies, Sociétés, Civilisations	66	-
Annals: American Academy of Political and Social Science	66	-
Analyse et Prévision	66	-
Anthropological Papers	66	-
Australian Outlook	66	-
British Journal of Criminology	66	-
Bureau of American Ethnology: Bulletin	66	-
Cahiers Internationaux	66	-
Cahiers Internationaux de Sociologie	66	-
Daedalus	66	-
Ekonomisk Tidsskrift	66	-
Esprit	66	-

Title	Rank Group A	Rank Group B
Industrial and Labour Relations Review	66	-
Journal for the Scientific Study of Religion	66	-
Journal of Negro Education	66	-
Journal of the Operations Research Society of America	66	-
Kriterion	66	-
Les Temps Modernes	66	-
Nation	66	-
Proceedings of the Aristotelian Society	66	-
Psychoanalytic Study of the Child	66	-
Review of Economic Statistics	66	123
Social and Economic Studies	66	-
Social Work	66	-
Transports	66	-
Foundations	66	-
Canadian Historical Review	66	-
Perspectives Socialistes	66	-
Economic Trends	66	-
Sredneaziatikii Sbornik	66	-
Revue d'Histoire Economique et Sociale	66	-
Economist	111	11
Bulletin of the Oxford University Institute of Statistics	111	123
Comparative Studies in History and Society	111	123
Current Sociology	111	123
Harvard Law Review	111	123
International Journal of Comparative Sociology	111	123
Journal of Clinical Psychology	111	123
Survey of Current Business	111	123
Journal of Experimental Psychology	-	1
Zeitschrift für Angewandte Psychologie	-	5
Psychological Review	-	2
American Journal of Psychology	-	4
Quarterly Journal of Experimental Psychology	-	8
British Journal of Delinquency	-	13
Journal of Verbal Learning and Verbal Behaviour	-	13
Child Development	-	17
Psychologische Arbeiten	-	17
Psychonomic Science	-	17
Journal of Genetic Psychology	-	28
Journal of Neurophysiology	-	17
Psychological Monographs	-	24
Zeitschrift für Experimentelle und Angewandte Psychologie	-	24
Journal of Mental Science	-	28
Acta Psychologica	-	40
Canadian Journal of Psychology	-	24
Historische Zeitschrift	-	33
Journal of Mental Education	-	33

Title	Rank Group A	Rank Group B
Journal of the American Medical Association	-	17
Psychological Reports	-	33
Archives de Psychologie	-	33
Archiv für die Gesamte Psychologie	-	40
Bulletin of the British Psychological Society	-	40
Journal of the Acoustical Society of America	-	40
Philosophical Studies	-	40
Rorschachiana	-	40
Social Service Quarterly	-	40
Yale Law Journal	-	40
Archiv für Psychiatrie und Nervenkrankheiten	-	50
Brain	-	50
Educational and Psychological Measurement	-	50
Industrial Psychotechnics	-	50
Journal of Experimental Education	-	50
Japanese Psychological Research	-	50
Journal of Educational Sociology	-	50
Lancet	-	40
Neue Psychologische Studien	-	50
Perceptual and Motor Skills	-	50
Praktische Psychologie	-	50
Psychologische Forschung	-	50
Psychologische Rundschau	-	50
Scottish Journal of Political Economy	-	50
Studium Generale	-	50
Vierteljahrschrift für wissenschaftliche Philosophie	-	50
Zeitschrift für pädogogische Psychologie	-	50
Acta Psychologica Scandinavica	-	76
Adult Education	-	76
Annals of the New York Academy of Sciences	-	76
Architectural Record	-	76
Betrieb	-	76
Biometrics	-	76
British Journal of Medical Psychology	-	50
British Journal of Psychiatry	-	76
British Journal of Psychology: Monograph Supplement	-	76
Canadian Journal of Corrections	-	76
Character and Personality	-	76
China Weekly Review	-	123
Chinese Economic Journal	-	76
Economic Record	-	76
Harpers Magazine	-	76
Electroencephalography and Clinical Neurophysiology	-	76
Encounter	-	76
Erkenntnis	-	76
Eugenics Quarterly	-	76
Grapholog MH	-	76
Harvard Educational Review	-	76

Title	Rank Group A	Rank Group B
Human Factors	-	76
L'Humanité	-	76
Journal of Clinical Psychology	-	123
Journal of Mathematical Psychology	-	76
Journal of Neurology, Neurosurgery and Psychiatry	-	76
Journal of the Optical Society of America	-	76
Kyklos	-	76
Language	-	76
London and Cambridge Economic Bulletin	-	76
Medical Journal of Australia	-	76
Opinion News	-	76
Psychologie Review	-	123
Psychologia	-	76
Psychosomatic Medicine	-	76
Publications of the American Statistical Association	-	76
Revue Internationale de Sociologie	-	50
Scandinavian Journal of Psychology	-	76
School and Society	-	76
Schrift	-	76
Sewanee Review	-	76
Skandinavisches Archiv fur Physiologie	-	76
Zeitschrift für Menschenkunde	-	76

APPENDIX 10

Removal of citations in selected source journals from the citation file and recalculation of frequency of citation of journals

The citations from journals in each of the major social science disciplines covered in the pilot study were removed for each discipline in turn from the file containing all the citations, and the number of citations from the remaining source journals calculated. The ranked lists of cited journals obtained after each operation are given in the following pages. Only the 50 most frequently cited titles are given in these lists, because changes in rank are few after the first 50.

Discipline	Journals removed
Criminology	British Journal of Criminology
Psychology	American Psychologist British Journal of Psychology Psychologische Forschung
Sociology	American Journal of Sociology American Sociological Review Archives Européenes de Sociologie British Journal of Sociology Sociological Review
Economics	Economica Economic Journal Revue Economique

FREQUENCY LIST OF CITED JOURNALS WHEN THE CRIMINOLOGY SOURCE JOURNAL IS REMOVED

Number		Frequency of citation
1	American Sociological Review	66
2	Journal of Experimental Psychology	39
3	Economic Journal	33
4	Zeitschrift für Angewandte Psychologie	31
5	Psychological Review	30
6	Review of Economic Studies	25
7	Psychology Bulletin	23
8	Journal of Political Economy	23
9	American Journal of Sociology	22
10	Journal of Abnormal and Social Psychology	22
11	American Journal of Psychology	22
12	Social Forces	22
13	Nature	19
14	American Economic Review	19
15	Quarterly Journal of Experimental Psychology	19
16	Science	17
17	Econometrica	15
18	Journal of Comparative and Physiological Psychology	15
19	Economie Appliquée	14
20	Economist	14
21	Journal of Personality	14
22	Economica	13
23	Journal of the Royal Statistical Society	12
24	Africa	11
25	Administrative Science Quarterly	11
26	Journal of Verbal Learning and Verbal Behaviour	11
27	British Journal of the Philosophy of Science	10
28	Review of Economics and Statistics	10
29	Public Opinion Quarterly	9
30	Quarterly Journal of Economics	9
31	Archiv für Psychologie	8
32	Child Development	8
33	Human Organisation	8
34	Journal of Consulting and Clinical Psychology	8
35	Medical Economics	8
36	Psychologische Arbeiten	8
37	Psychonomic Science	8
38	Revue d'Economie Politique	8
39	Canadian Journal of Economics and Political Science	7
40	American Antiquity	7
41	Journal of Neurophysiology	7
42	Journal of Psychology	7
43	Journal of Social Psychology	7
44	Manchester School	7
45	Psychological Monographs	7
46	Zeitschrift für Experimentelle und Angewandte Psychologie	7
47	American Journal of Orthopsychiatry	6
48	Journal of Genetic Psychology	6
49	Psychiatry	6
50	American Anthropologist	6

FREQUENCY LIST OF CITED JOURNALS WHEN THE PSYCHOLOGY SOURCE JOURNALS ARE REMOVED

Number		Frequency of citation
1	American Sociological Review	55
2	Economic Journal	33
3	Review of Economic Studies	25
4	Journal of Political Economy	23
5	Social Forces	22
6	American Journal of Sociology	21
7	American Economic Review	19
8	Journal of Experimental Psychology	17
9	Econometrica	15
10	Economie Appliquée	14
11	Economist	14
12	Quarterly Journal of Experimental Psychology	13
13	Economica	13
14	Journal of the Royal Statistical Society	13
15	Science	11
16	Africa	11
17	Administrative Science Quarterly	11
18	British Journal of Delinquency	11
19	British Journal of the Philosophy of Science	10
20	Review of Economics and Statistics	10
21	Public Opinion Quarterly	9
22	Quarterly Journal of Economics	9
23	Zeitschrift für Angewandte Psychologie	8
24	Journal of Abnormal and Social Psychology	8
25	Canadian Journal of Economics and Political Science	8
26	Human Organisation	8
27	Journal of Consulting and Clinical Psychology	8
28	Medical Economics	8
29	Revue d'Economie Politique	8
30	American Antiquity	7
31	International Journal of Social Psychiatry	7
32	Manchester School	7
33	Psychiatry	6
34	American Anthropologist	6
35	American Political Science Review	6
36	Monthly Labour Review	6
37	Sociometry	6
38	Sovetskaia Etnografiia	6
39	Nature	5
40	British Journal of Sociology	5
41	Current Notes	5
42	Etudes et Conjunctures	5
43	Historische Zeitschrift	5
44	Journal of American Folklore	5
45	Journal of Medical Education	5
46	Journal of Social Issues	5
47	Journal of the American Medical Association	5
48	Oceania	5
49	Psychologische Arbeiten	5
50	Sociological Review	5

FREQUENCY LIST OF CITED JOURNALS WHEN SOCIOLOGY SOURCE JOURNALS ARE REMOVED

Number		Frequency of citation
1	Journal of Experimental Psychology	39
2	Zeitschrift für Angewandte Psychologie	31
3	Economic Journal	29
4	Psychological Review	29
5	Review of Economic Studies	25
6	Psychology Bulletin	24
7	Journal of Political Economy	22
8	American Journal of Psychology	22
9	American Sociological Review	19
10	Journal of Abnormal and Social Psychology	19
11	Nature	19
12	Quarterly Journal of Experimental Psychology	19
13	American Economic Review	18
14	Econometrica	15
15	Journal of Comparative and Physiological Psychology	15
16	Science	14
17	Economie Appliquée	14
18	Economist	14
19	Journal of Personality	14
20	Social Forces	13
21	Journal of the Royal Statistical Society	13
22	American Journal of Sociology	12
23	Economica	12
24	British Journal of Delinquency	11
25	Journal of Verbal Learning and Verbal Behavior	11
26	Administrative Science Quarterly	10
27	Review of Economics and Statistics	10
28	Quarterly Journal of Economics	9
29	Archiv für Psychologie	8
30	Child Development	8
31	Journal of Consulting and Clinical Psychology	8
32	Psychol. Arbeiten	8
33	Psychonomic Science	8
34	Revue d'Economie Politique	8
35	American Journal of Orthopsychiatry	7
36	Canadian Journal of Economics and Political Science	7
37	American Antiquity	7
38	Journal of Neurophysiology	7
39	Psychological Monographs	7
40	Zeitschrift für Experimentelle und Angewandte Psychologie	7
41	Journal of Genetic Psychology	6
42	Journal of Psychology	6
43	Journal of Social Psychology	6
44	Psychiatry	6
45	American Political Science Review	6
46	Journal of Mental Science	6
47	Sovetskaia Etnografiia	6
48	American Journal of Psychiatry	5
49	Monthly Labour Review	5
50	Acta Psychologica	5

FREQUENCY LIST OF CITED JOURNALS WHEN ECONOMICS SOURCE JOURNALS ARE REMOVED

Number		Frequency of Citation
1	American Sociological Review	68
2	Journal of Experimental Psychology	39
3	Zeitschrift für Angewandte Psychologie	31
4	Psychological Review	30
5	Psychology Bulletin	24
6	American Journal of Sociology	23
7	Journal of Abnormal and Social Psychology	23
8	American Journal of Psychology	22
9	Social Forces	22
10	Nature	20
11	Quarterly Journal of Experimental Psychology	19
12	Science	17
13	Journal of Comparative and Physiological Psychology	15
14	Journal of Personality	14
15	Africa	11
16	Administrative Science Quarterly	11
17	British Journal of Delinquency	11
18	Journal of Verbal Learning and Verbal Behaviour	11
19	British Journal of the Philosophy of Science	10
20	Public Opinion Quarterly	9
21	American Journal of Orthopsychiatry	8
22	Archiv für Psychologie	8
23	Child Development	8
24	Human Organization	8
25	Journal of Consulting and Clinical Psychology	8
26	Medical Economics	8
27	Psychol. Arbeiten	8
28	Psychonomic Science	8
29	Economie Appliquée	7
30	American Antiquity	7
31	International Journal of Social Psychiatry	7
32	Journal of Genetic Psychology	7
33	Journal of Neurophysiology	7
34	Journal of Psychology	7
35	Journal of Social Psychology	7
36	Psychiatry	7
37	Psychological Monographs	7
38	Zeitschrift für Experimentelle und Angewandte Psychologie	7
39	American Anthropologist	6
40	American Journal of Psychiatry	6
41	Americal Political Science Review	6
42	Journal of Mental Science	6
43	Sociometry	6
44	Sovetskaia Etnografiia	6
45	Acta Psychologica	5
46	American Psychologist	5
47	British Journal of Sociology	5
48	Canadian Journal of Psychology	5
49	Current notes	5
50	Historische Zeitschrift	5

APPENDIX 11a

CLOSSS Titles on ISI Source Publications List

Acta Psychiatrica Scandinavica and supplement
Acta Psychologica
Administrative Management
American Anthropologist
American Behavioral Scientist
American Journal of Physical Anthropology
American Journal of Psychiatry
American Journal of Psychology
American Journal of Public Health and the Nations Health
American Journal of Sociology
American Psychologist
American Sociological Review
American Sociologist
American Statistician
Animal Behaviour
Année Psychologique
Annual Review of Psychology
Applied Statistics
Archives of General Psychiatry
Aslib Proceedings
Australian Journal of Psychology
Australian Journal of Statistics
British Journal of Addiction
Bulletin of the World Health Organisation
Behavioral Science
Behaviour
British Journal of Educational Psychology
British Journal of Industrial Medicine
British Journal of Preventive and Social Medicine
British Journal of Psychiatry
British Journal of Psychology
British Journal of Social and Clinical Psychology
Canadian Journal of Behavioral Science
Canadian Journal of Psychology
Canadian Psychologist
Canadian Review of Sociology and Anthropology
Child development
College and Research Libraries
Community Mental Health Journal
Current Anthropology
Cybernetica
Demography
Dock and Harbour Authority
Econometrica
Educational and Psychological Measurement
Educational Review
Ergonomics

Ethnology
Foundations of Language
Genetic Psychology Monographs
Geographical Journal
Harvard Business Review
Human Development
Human Factors
Human Relations
Impact of Science on Society
International Journal of Agrarian Affairs
International Journal of Group Psychotherapy
International Journal of Psycho-analysis
Journal of Abnormal Psychology and supplement
Journal of the Acoustical Society of America
Journal of the American Academy of Child Psychiatry
Journal of the American Statistical Association
Journal of the Analytical Psychology
Journal of Applied Behavioral Science
Journal of Applied Psychology and Monograph
Journal of Biosocial Science
Journal of Child Psychology and Psychiatry and Allied Disciplines
Journal of Clinical Psychology
Journal of Conflict Resolution
Journal of Counselling Psychology
Journal of Documentation
Journal of Educational Research
Journal of Experimental Social Psychology
Journal of General Psychology
Journal of Genetic Psychology
Journal of Gorontology
Journal of Management Studies
Journal of Neurology, Neurosurgery and Psychiatry
Journal of Personality
Journal of Personality and Social Psychology and Supplement
Journal of Psychology
Journal of Psychosomatic Research
Journal of the Royal Statistical Society Series A. General
Journal of the Royal Statistical Society Series B. Methodological
Journal of Social Psychology
Language and Speech
Library Quarterly
Mental Hygiene
Operational Research Quarterly
Personnel
Personnel Psychology
Philosophy of Science
Phonetics
Psychiatric Quarterly
Psychiatry
Psychoanalytic Review
Psychological Bulletin
Psychological Issues
Psychological Review
Psychometrika
Public Health Reports

Public Opinion Quarterly
Rural Sociology
Science
Social Psychiatry
Social Forces
Sociology
Sociology and Social Research
Sociometry
Special Libraries
Traffic Quarterly
Transportation Research
Unesco Bulletin for Libraries
WHO Chronicle

APPENDIX 11b.

Subject analysis of CLOSSStitles on ISI Source Publications list

Subject	No.	%
Psychology	50	40
Sociology	12	10
Public Health and Social Medicine	9	7
Statistics	6	5
Information Science	6	5
Economics	6	5
Anthropology	5	4
Others	21	16
TOTAL	115	

APPENDIX 11c

Source journals by subject covered by SCI 1970

Subject	No. of Journals*	% of Total of SCI	No. of Journals †	% of Total SCI
Behavioural Science	17	0.78	4	0.18
Education	21	0.96	13	0.59
Geography	5	0.23	2	0.09
Library Sci	33	1.60	26	1.19
Linguistics	6	0.27	4	0.18
Management	11	0.50	11	0.50
Psychiatry	21	0.96	12	0.55
Psychology	91	4.15	65	2.97
Soc. Sci	14	0.64	9	0.41
Statistics	18	0.82	3	0.14
TOTALS	237	10.9	149	6.80

* Journals in subjects not mutually exclusive

† Journals in subjects are exclusive

Journals overlapping subjects

Behavioural Science	9 psychology, 1 linguistics, 2 zoology, 1 medicine.
Education	5 psychology, 1 chemistry, 1 medicine, 1 electrical and electronic engineering.
Geography	2 geology, 1 geoscience/earth science.
Library Science	1 medicine, 4 electrical and electronic engineering, 1 linguistics and electrical and electronic engineering, 1 chemistry, 1 optics.
Linguistics	1 behavioural science, 1 library science.
Management	None.
Psychiatry	8 psychology, 1 physiology
Psychology	8 psychiatry, 9 behavioural sci., 4 education, 1 education and social science, 1 social science, 2 physiology, 1 statistics.
Social Science	1 biology, 1 psychology, 2 education, 1 psychology and education.
Statistics	14 mathematics, 1 psychology.

Summary of overlap figures

35 journals overlap with non-social science subjects

51 journals overlap with social science subjects

1 journal overlaps both science and social science subjects.

APPENDIX 12

Random sample of titles from CLOSSS

Agricultural Education Magazine
Archivní Časopis
Asia Pacific Record
Colorado University Studies. Series in Sociology
Allgemeines Statistisches Archiv
NAAS Quarterly Review
Population Studies
UNESCO Bulletin for Libraries
Archiv für Offentliche und Freigemein Wirtschaftliche Unternehmen
Recall
Rural Sociology
Land and Liberty
Journal of the Royal Statistical Society.Series B
College and Research Libraries
Human Relations
Consommation
Transactions of the Historic Society of Lancashire and Cheshire
Architektura
Afrasian Markets
Newcomen Society for the Study of the History of Engineering and Technology,Transactions
Rivista Storica Italiana
American Sociological Review
Philippine Social Science Review
General Linguistics
Archaeologiai Ertesito
Boletin de Estudios Economicos
Balkan Review
Trimestre Economico
Public Administration Review
Italian Studies
Irish Geography
Progress in Geography
Tokyo Municipal News
Alaska Review of Business and Economic Conditions
Yorkshire Bulletin of Economic and Social Research
Journal of the Language Teaching Association of Eastern Africa
Review of Social Economy
Journal of Social Issues
Foundations of Language
Maternal and Child Care
Labour Organiser
Arrive
Analele Universitafi Bucuresti Seria Stiinte Sociale -Filologie
Analysis of Current Developments in the Soviet Union
Soviet Geography
Smokeless Air

Growing Point
Taxation
Acta Psychiatrica et Neurologica Scandinavica
Review of Economic Studies
Linguistic Enquiry
Liberal Education
Employment and Productivity Gazette
Journal of the Institutes of Education of the Universities of Newcastle upon Tyne and Durham
Journal of Experimental Research in Personality
American Vocational Journal
Journal of Clinical Psychology
Problemi della Sicurezza Sociale
Advances in Communications Systems Theory and Applications
Bulletin de l'Institut International d'Administration Publique
Survey of Current Business
Agrarwirtschaft
Aconcagua
Architecture West Midlands
West African Journal of Education
International Journal of Adult and Youth Education
Adolescence
Activist
Music in Education
Royal Society for the Promotion of Health,Journal
Human Development
Operational Research Quarterly
Anglo-Soviet Journal
National Institute of Industrial Psychology,Bulletin
Arab Views
Filosofska Misul
Head Teacher Review
British Journal of Sociology
American Journal of Correction
Administrative Science Quarterly
Bulletin du Centre Européen de la Culture
International Journal of American Linguistics
American Federationist
Tijdschrift Voor Economische en Sociale Geografie
Journal of English as a Second Language
Neuren Sprachen
Française Moderne
Rivista di Dritto del Lavoro
African Scientist
Anglo-Norwegian Trade Journal
Revue de Phonétique Appliquee
Journal of Psychosomatic Research
AlgemeenNederlands Tijdschrift voor Wijsbegeerte en Psychologie
Geographical Analysis
Library Trends
Southern Economic Journal
Absatzwirtschaft
Cahiers Ferdinand de Saussure
Eastern Librarian
Scottish Journal of Political Economy

APPENDIX 13

Core Journals identified by Social Science Librarians (arranged by subject)

GEOGRAPHY

Geographical Journal
Transactions of the Institute of British Geographers
Scottish Geographical Magazine
Geography
Economic Geography
Geographical Review
Tijdschrift voor Economische en Sociale Geografie
Geografiska Annaler

EDUCATION

British Journal of Educational Psychology
British Journal of Educational Studies
British Journal of Educational Technology
Child Development
Educational Research
Educational Review
Harvard Educational Review
International Review of Educational
Journal of Curriculum Studies
Trends in Education

HISTORY

English Historical Review
Bulletin of the Institute of Historical Research
Economic History Review
Past and Present
Historical Journal
History
Journal of British Studies

ECONOMICS

American Economic Review
Economica
Lloyds Bank Review
Review of Economics and Statistics
Economist
Economic Trends
DEP Gazette
British Tax Review

POLITICS

Political Quarterly
Political Studies

INTERNATIONAL RELATIONS

American Journal of International Law
Foreign Affairs
International Affairs
International Journal
International Organisation
Orbis
World Today
Far Eastern Economic Review
West Africa
U.S. News and World Reports

PUBLIC ADMINISTRATION

Public Administration
Parliamentary Affairs
Public Administration Review
Municipal Journal
Local Government Chronicle
Local Government Finance
Municipal Review
Rural District Review
O & M Bulletin
PAC Bulletin

PLANNING

Planning
Environment and Planning
Town and Country Planning
Town Planning Institute Journal
American Institute of Planners Journal
Town Planning Review
Urban Studies

GENERAL

New Society
New Statesman
Spectator

PSYCHOLOGY

Behavioral Science
Brit. J. Psychology
Genetic Psychol. Monogr.
J. General Psychology
J. Personality
J. Abnormal Psychology
J. Personality & Soc. Psychol.
J. Psychology

SOCIAL PSYCHOLOGY

Brit. J. Soc. & Clin. Psychol.
J. Social Issues
J. Social Psychology
Sociometry

CHILD PSYCHOL. AND PSYCHIATRY

Child Development
Developmental Psychology
J. Amer. Acad. Child Psychiat.
J. Child Psychol. & Psychiat.
Merrill-Palmer Quart.

PSYCHIATRY

Amer. J. Orthopsychiatry
Amer. J. Psychiatry
Amer. J. Psychotherapy
Arch. General Psychiatry
Brit. J. Medical Psychol.
Brit. J. Psychiatry
J. Nervous & Mental Disease
Psychiatric Quart.
Psychiatry

PSYCHOANALYSIS

Int. J. Psychoanalysis
J. Amer. Psychoanal. Assoc.
Psychoanalytic Quart.

OCCUPATIONAL PSYCHOLOGY

Admin. Science Quart.
J. Applied Behav. Science
J. Applied Psychology
Occupational Psychology
Personnel Psychology

SOCIOLOGY

Amer. J. Sociology
Amer. Sociological Review
Brit. J. Sociology
Social Forces
Social Problems
Sociological Review
Sociology

SOCIAL WORK

Brit. J. Social Work
Social Casework
Social Service Review
Social Work (NY)
Social Work Today

GENERAL AND NOT CLASSIFIED

Family Process
Human Organisation
Human Development
Human Relations
Social Science and Medicine
Social Science Information

APPENDIX 14

Supplementary List of Journal titles for Easter 1972, drawn from Appendix 13 and Dews (1969)

EDUCATION

British Journal of Educational Psychology
British Journal of Educational Technology
Educational Research
Journal of Curriculum Studies
Trends in Education

GEOGRAPHY

Geographical Journal
Transactions of the Institute of British Geographers
Geography
Geographical Review
Tijdschrift voor Economische en Sociale Geografie
Economic Geography

PUBLIC ADMINISTRATION

Public Administration
Parliamentary Affairs
Municipal Journal
Rural District Review
O & M Bulletin

PSYCHOANALYSIS

International Journal of Psychoanalysis
Journal of the American Psychoanalytical Association

SOCIAL WORK

British Journal of Social Work
Social Service Review
Social Work (USA)

MANAGEMENT AND BUSINESS STUDIES

Ergonomics
Management Today
Personnel
Harvard Business Review
Journal of Business
Journal of Marketing Research

APPENDIX 15

Foreign Language Titles

Allgemeines Statistisches Archiv

Annales: economies, societés, civilisations

*Annales de Géographie

Archives européennes de sociologie

Bulletin de l'Institut international de statistique

Cahiers internationaux de sociologie

*Economia internazionale

Economie appliquée

*Etudes et conjoncture

*Finanz-Archiv

*Kolner Zeitschrift für Soziologie

*Kommunist (Russian)

*Kyklos

Planovoe Khoziaistvo

*Raumforschung und Raumordnung

*Revue française de science politique

*Revue française de sociologie

Schmollers Jahrbuch

Tiers Monde

*Voprosy ekonomiki

*Wirtschaft und Statistik

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*Journal used as source.

APPENDIX 16

Summary of citation data collected Easter 1972

Ranked list:	the first 50 most frequently cited journals from pilot study list (Appendix 6a)
Random list:	50 journals selected at random from CLOSSS (Appendix 12)
Extra titles:	supplementation of the ranked list to include subjects otherwise inadequately represented (Appendix 13)
Libraries used:	Senate House, London University (S.H.) Institute of Education, London University (Inst.Ed.) Ladbroke House, Polytechnic of North London (Ladbroke) London School of Economics (LSE) Tavistock Joint Library Centre (Tavistock) Language Teaching Library (L.T.L.) Royal Geographical Society (R.G.S.) National Lending Library (N.L.L.) Essex Road, Polytechnic of North London (Essex Rd.)

C = all citations for 1970 (or rarely 1969) collected

(C) = more than 500 citations for 1970 (or rarely 1969) collected

I = on ISI source tapes in 1971

Total citations collected Easter 1972 : approximately 25,000

Random List

	Journal Title	done	Library	Comments	Approx.no. citations	On ISI
1	Growing point	C		Book reviews only	0	
2	Taxation	C	Ladbroke	Ø	0	
3	Acta Psychiatra et neurol. scandinavica					
4	Rev. of economic studies		Ladbroke			
5	Linguistic enquiry	C	L.T.L.		390	
6	Liberal education	C	S.H.		100	
7	Employment & prod. gaz.	C	Ladbroke		0	
8	J. Insts. of Ed. of Univs. of Durham	C	Inst. Ed.		12	
9	J. Exp. Res. in Personal.					
10	Am. vocational J.					
11	J. clinical psychol.					1
12	Problemi della sicurezza sociale					
13	Advances in communications systems theory & applications					
14	Bulletin de l'institut inter. d'administration publique					
15	Survey of current business					
16	Agrarwirtschaft					
17	Aconcagua		N.L.L.			
18	Architecture West Midlands		N.L.L. ?			
19	West African J. of education	C	L.T.L.		260	
20	Int. J. of adult & youth education					
21	Adolescence	(C)	Tavistock		585	
22	Activist		N.L.L.			
23	Music in Education	C	Inst.Ed.		16	
24	Royal Soc.for the promotion of health J.					
25	Human development	C	Tavistock		500	1
26	Operational Res. Q.		Ladbroke			1
27	Anglo-Soviet J.	C	S.H.		0	
28	Occup. psychology	C	Ladbroke		325	
29	Arab views		N.L.L.			
30	Filosofska Misul					
31	Head teacher review					
32	Brit. J. Sociol.	C	Ladbroke		720	
33	Am. J. of correction					
34	Admin. Sci. Q.		Ladbroke	on ranked list (25th)		
35	Bull. du centre Europ. de la culture		N.L.L.?			
36	Int. J. of Am. linguistics	C	L.T.L.		360	
37	Am. Federationist					
38	Tijdschrift voor economische en sociale geografie			?some done - p308		
39	J. of Eng. as 2nd lang.					
40	Neuren Sprachen	C	L.T.L.		800	

Random list (cont.)

41	Français moderne	C			270	
42	Rivista di dritto del lavoro					
43	African scientist		N.L.L.			
44	Anglo-Norwegian Trade J.		N.L.L.			
45	Rev. de phonétique appliquée					
46	J. psychosomatic res.					1
47	Algemeennederlands Tijdschrift voor wijsbegeerte en psychol.					
48	Geographical analysis	C	R.G.S.		530	
49	Library trends	C	Essex Rd.		450	
50	Southern economic J.	C	LSE		320	
51	Absatzwirtschaft		N.L.L.			
52	Cahiers ferdinand de saussure	C	L.T.L.		130	
53	Eastern librarian		Essex Rd.			
54	Scottish J. of polit.econ.			June & Nov.done		

Ranked List.

	Journal Title	done	Library	Comments	Approx. no. citations	On ISI
1	American sociological review	(C)	Ladbroke		650	I
2	J. of experimental psychology	(C)	Ladbroke	p390(exc)	780	I
3	Economic J.	C	Ladbroke		550	
4	Z. für psychologie					
5	Psychological review		Ladbroke			I
6	Review of economic studies	C	Ladbroke		650	
7	Am. J. of psychology					I
8	Psychological bulletin	(C)	Ladbroke	1970. Vol. 73. p989 - article finished + p238 - article finished. Vol. 74. p81	850	I
9	Am. J. of sociology	C	Ladbroke		780	I
10	J. of political economy	C	LSE		1100	
11	Social forces	C	Ladbroke		640	I
12	Am. economic review	C	LSE		1420	
13	Q.J. of experimental psychol.					I
14	J. of comp. & physiol. psychol.					I
15	Econometrica					I
16	J. of abnormal psychol.		Ladbroke			I
17	J. of social psychol.					I
18	Economie appliquée					
19	J. of personality					I
20	Economica	C	LSE		450	
21	J.of the Royal Stats. Soc. series A	C	Ladbroke		360	I
22	Africa		S.H.	Incomplete - 100 done. Last part of Vol.40 not there		
23	Review of economics & stats.	C	Ladbroke		730	
24	Revue d'économie politique	C	LSE		520	
25	Admin. science Q.	(C)	Ladbroke		580	
26	B.J. of Criminology	C	Ladbroke		390	
27	J. of verbal learning & verbal behaviour	(C)	L.T.L.		950	I
28	Q.J. of economics	C	LSE		680	
29	Psychol. arbeiten					
30	Public opinion Q.		Ladbroke			I
31	Am. J. of orthopsychiatry					I
32	Arch. für psychologie					
33	Can. J. of economics & political science	C	LSE		500	
34	Child development		Ladbroke			I
35	Human organisation	C			390	
36	J. consulting & clinical psychology					I
37	J. of genetic psychol.					I
38	Psychonomic science					I

39	Am. antiquity	(C)	S.H.		1040	
40	Am. psychologist		Ladbroke			1
41	Am. political science rev.		Ladbroke			
42	Can. J. psychol.					1
43	China digest					
44	Int. J. social psychiat.		Tavistock	Not finished - 450 done p287 cit.13		
45	J. of psychology					1
46	Manchester school of economic & social studies	C			280	
47	Monthly labor review					
48	Psychiatry					1
49	Psychol. monographs					
50	Z. experiment. und angewandte psychol.					

Extra Titles

	Journal title	done	Library	Comments	Approx no. citations	On ISI
1	Brit. J. of Educational Psychol.					I
2	Brit. J. of Educational Technol.	C	Inst.Ed.		260	
3	Educational Research	(C)	?Ladbroke	done to r.h. col. p.193	520	
4	J. of Curriculum Studies	C	L.T.L.		150	
5	Trends in Education	C	Inst.Ed.		23	
6	Geographical Journal					I
7	Trans. of Inst. of British Geographers	C	S.H.		650	
8	Geography	C	S.H.		430	
9	Geographical Review					
10	Tijdschrift voor Economische en Sociale Geog.	C	S.H.		430	
11	Economic geography	(C)	S.H.	Being done. 560 cits. done	560	
12	Public Administration	C	S.H.		359	
13	Parliamentary Affairs	C	Ladbroke		330	
14	Municipal J.					
15	Rural District Rev.					
16	O & M Bulletin	C	Ladbroke		32	
17	Inter. J. Psychoanalysis	C	S.H.		702	I
18	(British J.)Social work (GB)	C	Ladbroke	Now:British J. of social work = Social work (GB + Br.J. psychiatric S.W.)	195	
19	Social service review	C	Tavistock		800	
20	Social work (USA)		S H.			
21	Ergonomics		S.H.	Up to & inc. p265 done (420 cs)		I
22	Management today	C	Ladbroke		0	
23	Personnel					I
24	Harvard business Rev.	C	Ladbroke		360	I
25	J. of business	C	LSE		360	
26	J. of marketing Research					

Summary of citations collected from journals covered by ISI source tapes

In the main citation study priority was given to the collection of data from the source journals not covered by ISI source tapes in 1971. However, some citations were taken from journals covered by ISI tapes; a summary of the number of citations collected is given below. This data will not duplicate the data available from the ISI source tapes because it was collected from journals published in 1970 whereas the ISI data is for the third quarter of 1971.

Journal title	Code	Collected by PNL	No. of citations
Acta Psychiatrica Scandinavica	ACT PSYC SC		
American Anthropologist	AM ANTHROP		
Am. J. Orthopsychiatry	AM J ORTHOP		
Am. J. Psychology	AM J PSYCHO		
Am. J. Sociology	AM J SOCIOL	YES	800*
Am. Psychologist	AM PSYCHOL		
Am. Sociological Review	AM SOCIOL R	YES	600
British J. Educational Psychology	BR J ED PSY		
British J. of Psychiatry	BR J PSYCHI		
Canadian J. Psychology	CAN J PSYCH		
Child Development	CHILD DEV		
Econometrica	ECONOMETRIC		
Ergonomics	ERGONOMICS	YES	400
Geographical J.	GEOGR J		
Harvard Business Review	HARV BUS RE	YES	360*
Human Development	HUMAN DEV	YES	500*
International J. Psychoanalysis	INT J PSYCH	YES	650*
J. Abnormal Psychology	J ABN PSYCH		
J. Clinical Psychology	J CLIN PSYCH		
J. Comparative & Physiological Psychology	J COM PHYSL		
J. Consulting & Clinical Psychology	J CONS CLIN		
J. Experimental Psychology	J EXP PSYCH	YES	750
J. Genetic Psychology	J GENET PSY		
J. Personality	J PERSONAL		
J. Psychology	J PSYCHOL		
J. Psychosomatic Research	J PSYCHOSOM		
J. Royal Statistical Soc. Series A	J ROY STA A	YES	300*
J. Social Psychology	J SOC PSYCH		
J. Verbal Learning and Verbal Behaviour	J VERB LEAR	YES	900
Operational Research Q	OPERAT R Q		
Personnel	PERSONNEL		
Psychiatry	PSYCHIATRY		
Psychological Bulletin	PSYCHOL B	YES	800

Psychological Review	PSYCHOL R		
Psychonomic Science	PSYCHON SCI		
Public Opinion Q	PUBL OPIN Q		
Q.J. Experimental Psychology	Q J EXP PSY		
Social Forces	SOCIAL FORC	YES	600*

* Data collection completed.

APPENDIX 17

List of DISISS Working Papers

No. 1 Comparison of results of science user studies with "Investigation into Information Requirements of the Social Sciences". July 1971.

No. 2 A machine readable data base of social science serials. November 1971.

No. 3 The relationship between primary and secondary literature in the social sciences: a study of secondary literature in criminology. June 1972.

No. 4 Characteristics of citations in social science monographs. June 1972.

No. 5 Citation patterns in the social sciences: results of pilot citation study and selection of source journals for main citation study. October 1972.

No. 6 Preliminary work on identifying networks of journal articles and authors in selected areas of the social sciences. December 1972.

No. 7 Size of monograph literature in social science (in preparation).

No. 8 CLOSSS: a machine readable data base of social science serials: progress report 1971-1972. December 1972.

No. 9 Monograph titles cited in social science journal articles. January 1973.

No. 10 The relationship of frequency of citation to use and value (in preparation).

FIG I JOURNALS CITED TWICE OR MORE

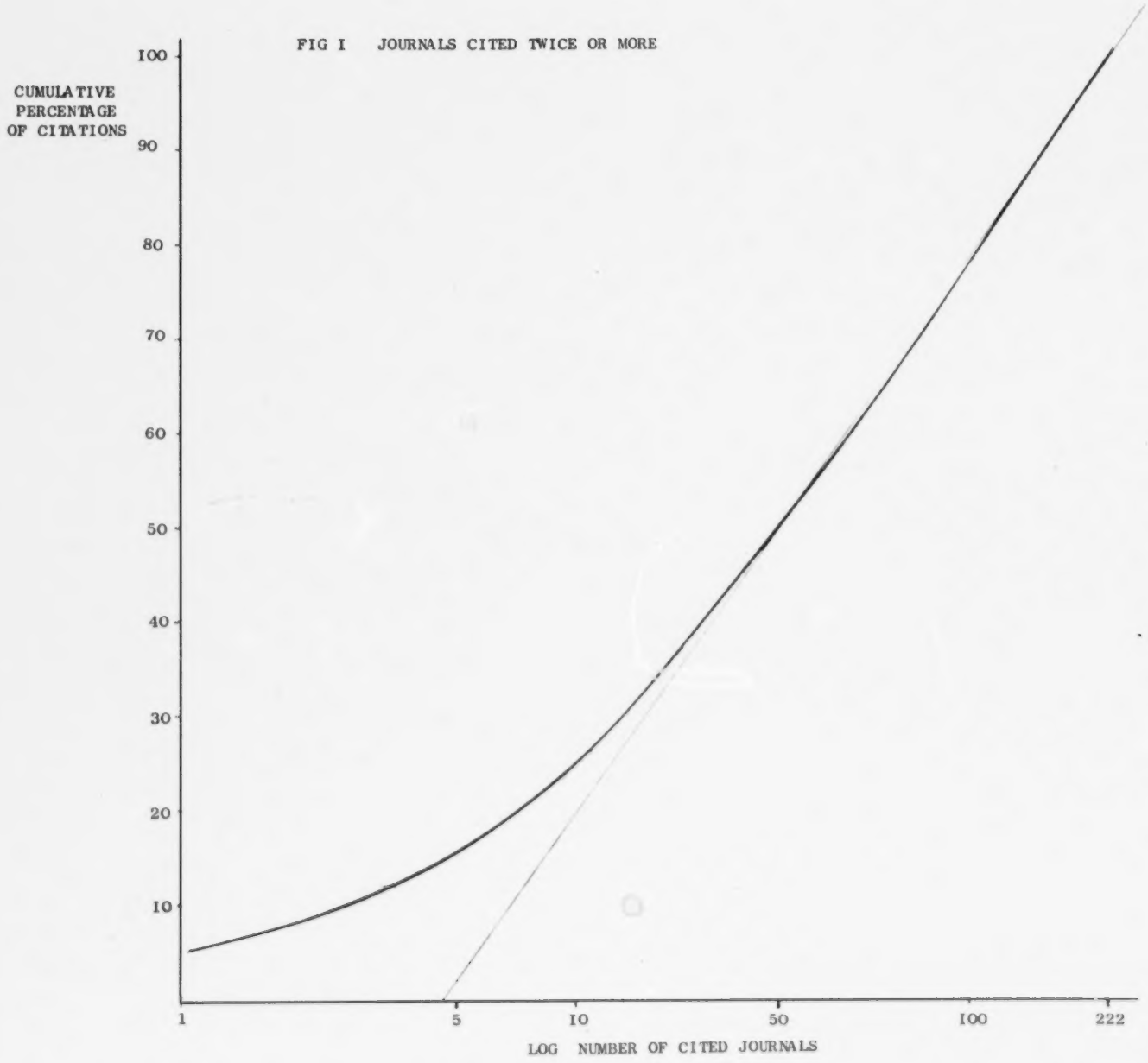

FIG 2 ALL JOURNALS CITED

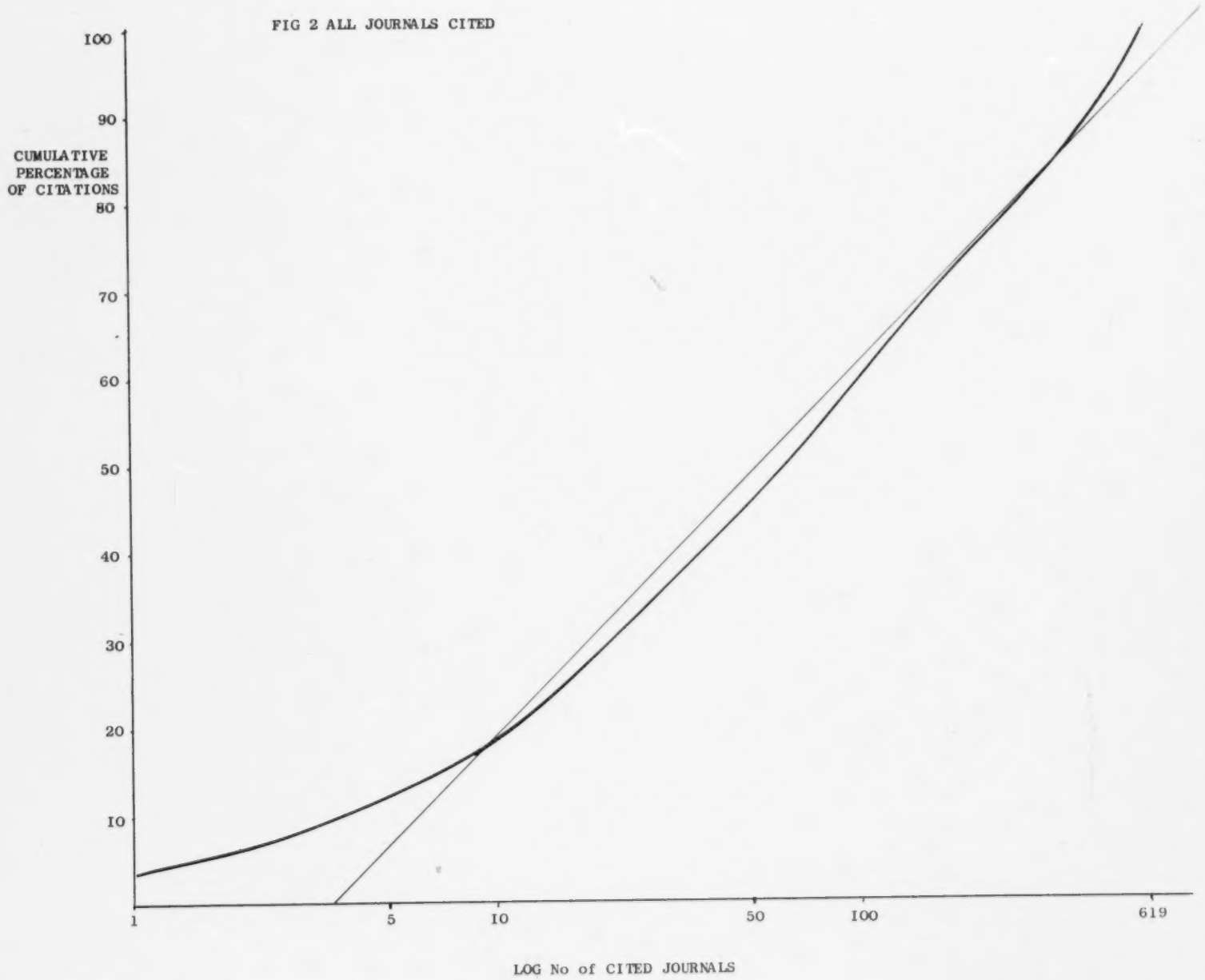

FIG 3 JOURNALS CITED TWICE OR MORE WITH CRIMINOLOGY SOURCE JOURNALS REMOVED

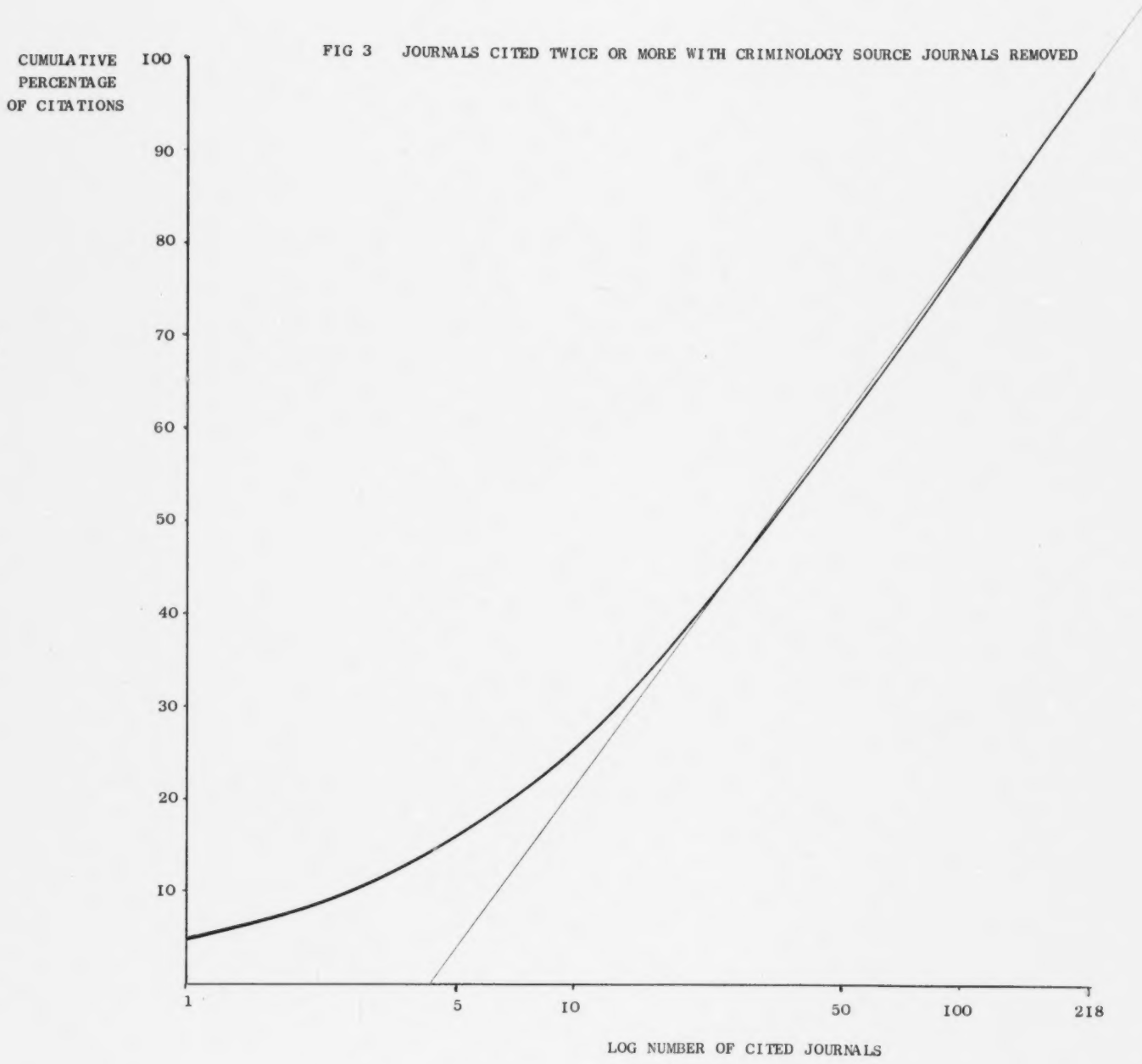

FIG 4 JOURNALS CITED TWICE OR MORE WITH PSYCHOLOGY SOURCE JOURNALS REMOVED

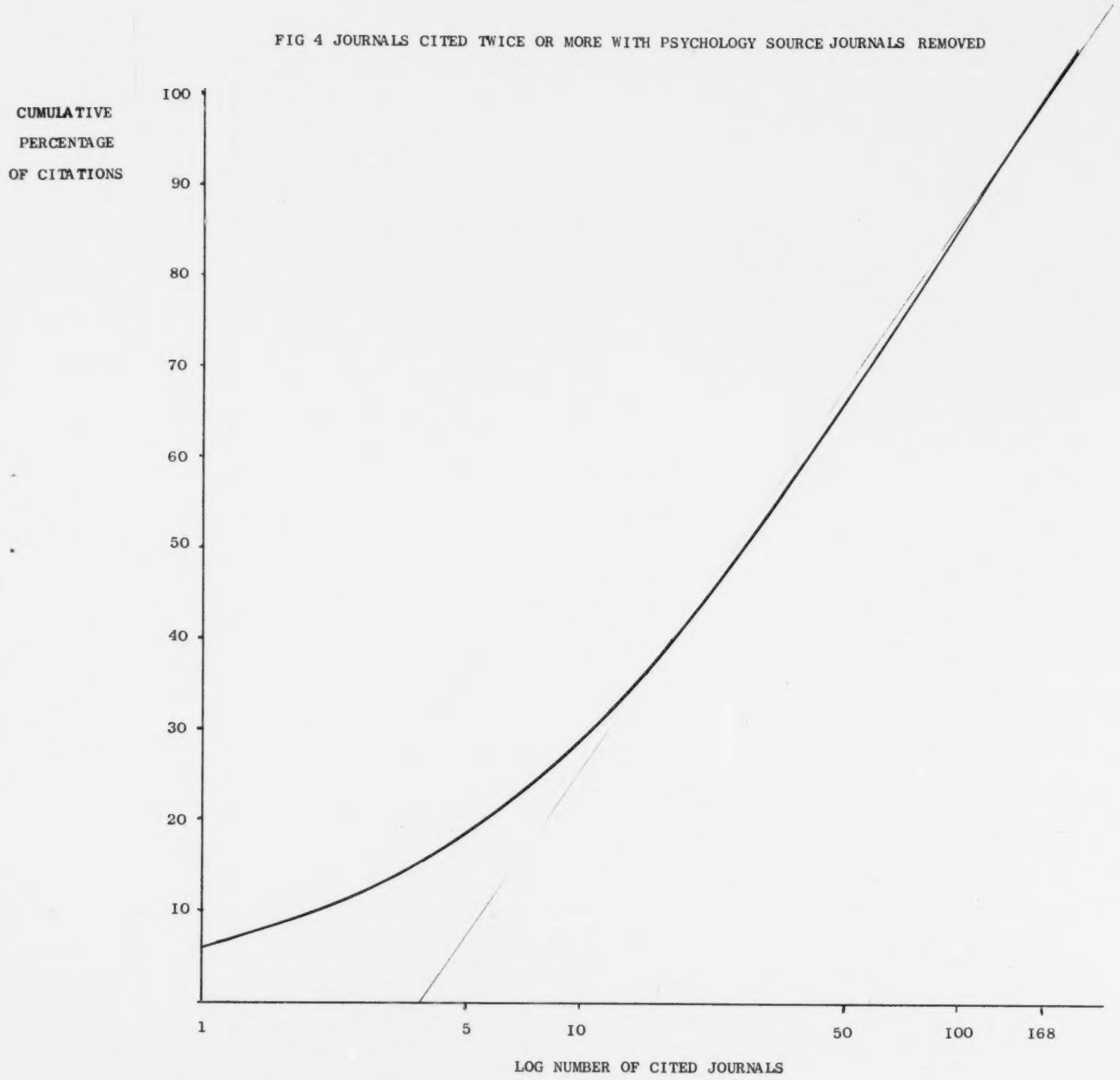

FIG 5 JOURNALS CITED TWICE OR MORE WITH SOCIOLOGY SOURCE JOURNALS REMOVED

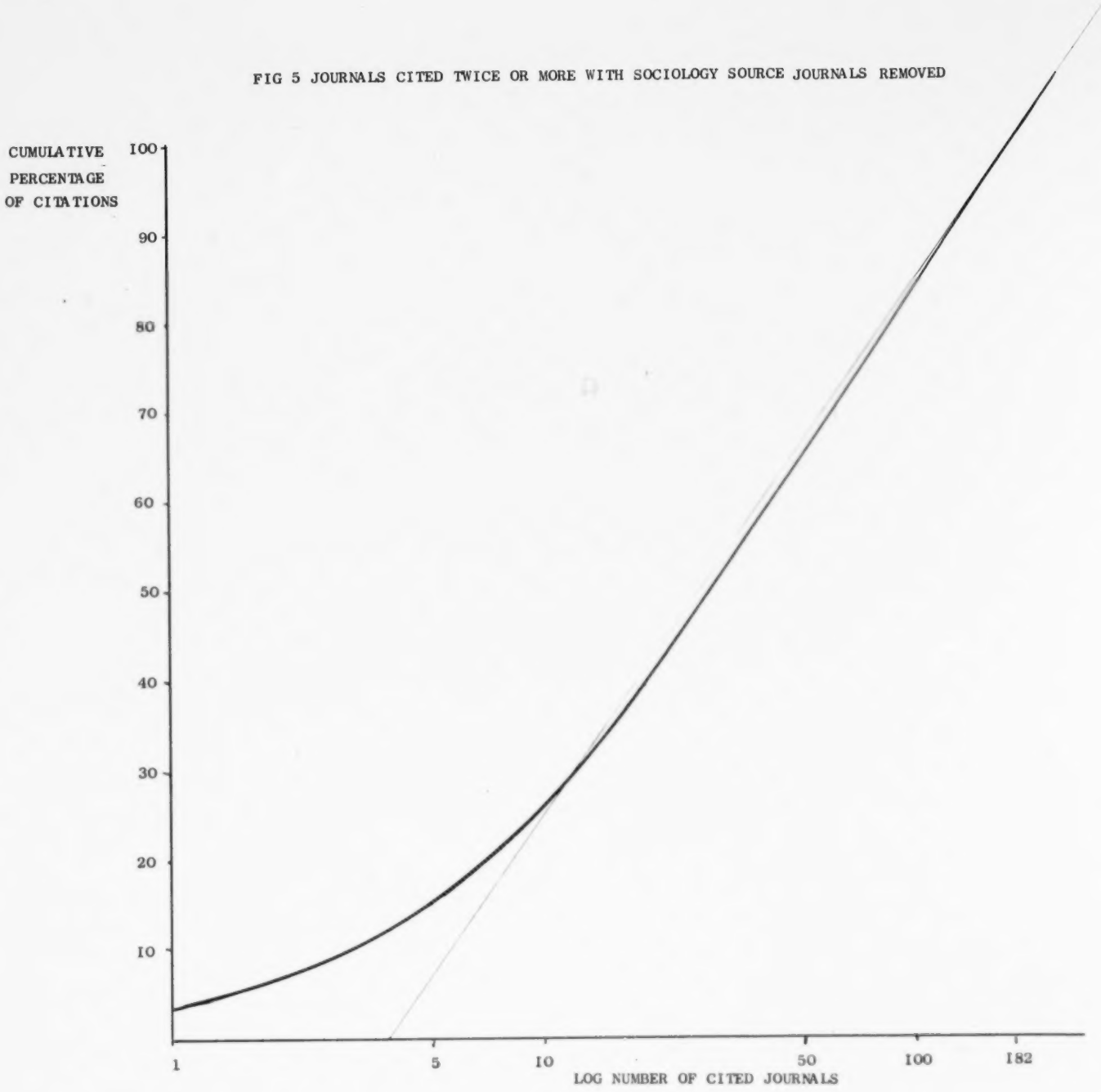

FIG 6 JOURNALS CITED TWICE OR MORE WITH ECONOMIC SOURCE JOURNALS REMOVED

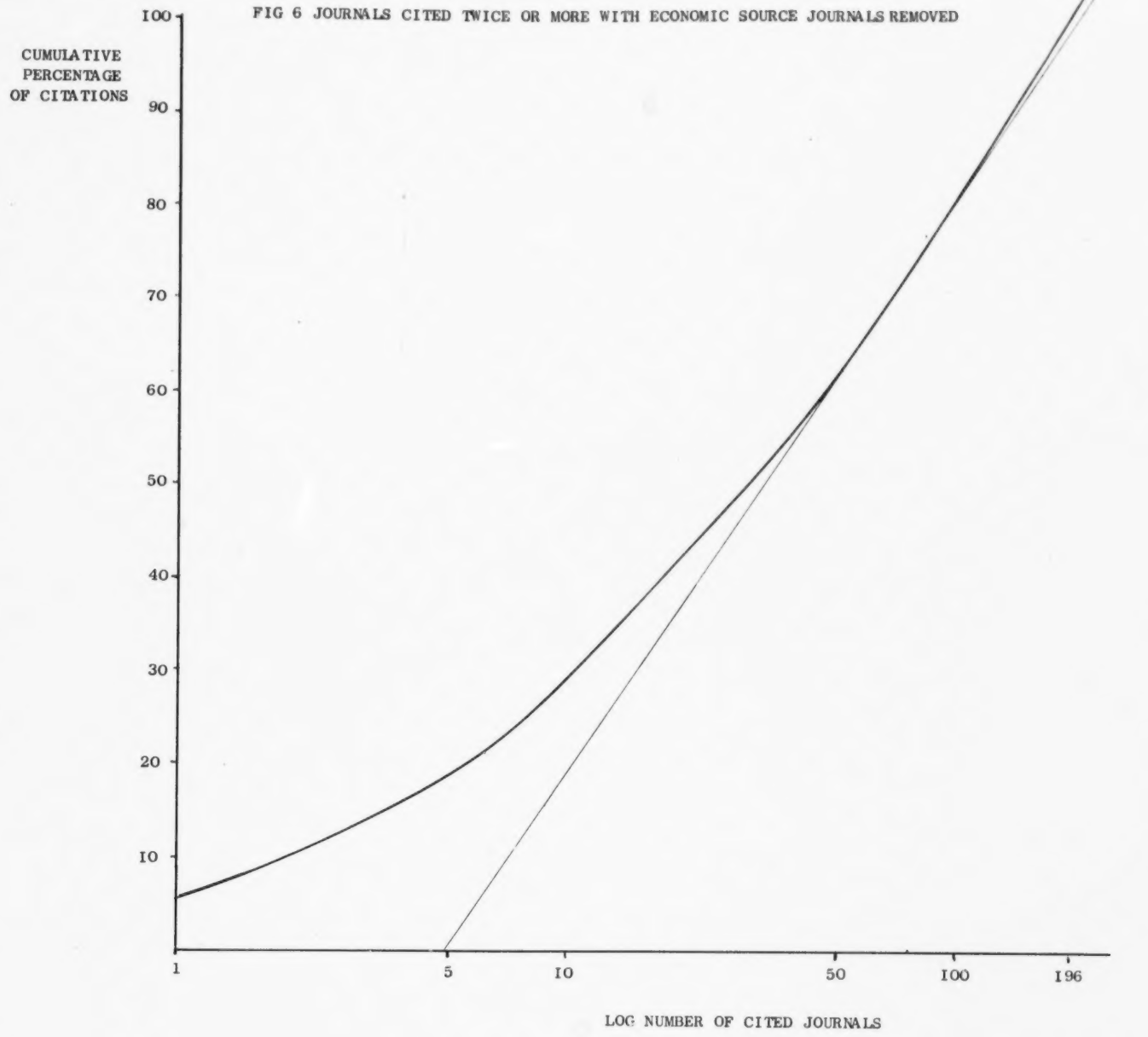

FIG 7 JOURNALS CITED TWICE OR MORE